

TECHNICAL DATA SHEET

Revision 2.1 Revision Date: 02/10/2020



Nexus Nu-Clear Cored Solder Wire

Manual and Automated Soldering

Description

Nexus Nu-Clear Cored Solder Wire is formulated for no clean, lead free, automated and hand soldering operations requiring fast wetting and defect free soldering of even the most difficult to solder components and board PCB finishes. Nexus Cored Solder leaves a minimal, clear, no clean residue. Tested to Industry standards including J-STD-004B and Bellcore GR78 Core (ECM), Nexus residues can be considered safe to remain on an assembly when no-clean technology is appropriate to the assembly end-use. Nexus Cored Solder offers excellent soldering performance and represents the next generation in lead free soldering.

Benefits

- No Clean
- Minimal, Clear, Non-Tacky Residues
- Powerful Wetting, High Speed Soldering
- RoHS & REACH Compliant (Lead Free Alloys)
- Suitable for Fast 'Drag Soldering', High Speed Automated Soldering and Manual Soldering
- Low Odour, Non-Offensive Fumes
- Excellent for Copper, Brass, Nickel and Zinc

Classification

Flux	J-STD-004A	J-STD-004B	J-STD-004B (Amendment 1)
Nexus Nu-Clear	ROL0	ROL1	ROM1
Nexus Gold*	ROL0	ROL1	ROL1
Nexus Space*	ROL0	ROL0	ROL0

* Alternative products in the Nexus range.

Properties

Flux Classification (J-STD-004B)	ROM1
Quantitative Halide (J-STD-004B) (IPC-TM-650 2.3.28)	1.5% Nominal
Rosin Softening Point	70-80°C
Surface Insulation Resistance (J-STD-004B) (IPC-TM-650 2.6.3)	Pass
Electro Migration (Bellcore GR-78) (IPC-TM-650 2.6.14)	Pass
Copper Mirror Test (J-STD-004A/B) (IPC-TM-650 2.3.32)	Pass
Copper Corrosion Test (J-STD-004A/B) (IPC-TM-650 2.6.15)	Pass

Availability

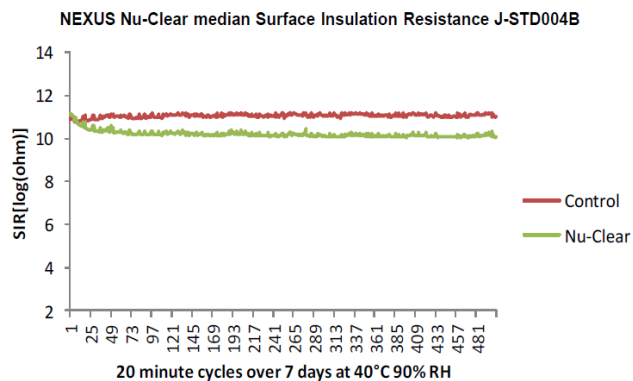
Product	Flux Content	Standard Packaging
Nexus Nu-Clear	1%, 2% and 3%	0.25Kg, 0.5Kg, 2.5Kg, 3Kg, 5Kg and 10Kg reels

Other packaging options available. For more information on alternate packaging options please contact our sales team.

Available in all SAC, Sn Ag, Sn Cu alloys and Warton High Purity SC100e a cobalt doped, strong, shiny, low cost SAC alternative.

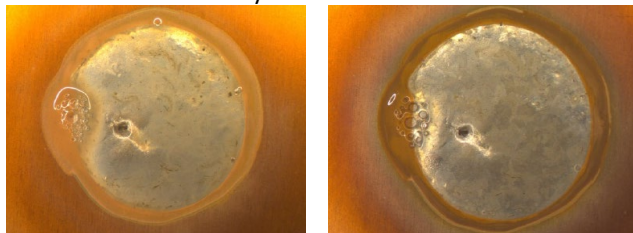
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Test Data



7 day continuous Surface Insulation Resistance test, testing cycles every 20 minutes at 5V. Showing no dendrite formation and far exceeding J-STD-004B requirements of greater than 100 MΩ.

J-STD 004B 10 day corrosion test. 40°C 93% RH

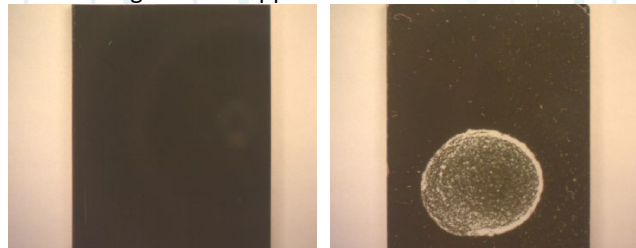


0 Hours

240 Hours

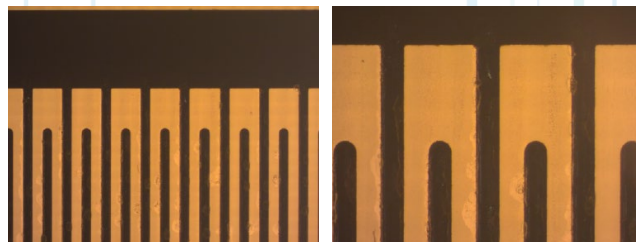
No evidence of corrosion or green/blue discolouration.

J-STD-004B copper mirror test. 24 hr 23°C 50% RH requirement for type L (low corrosion) is no evidence of breakthrough of the copper mirror.



Nu-Clear Type L Flux
(non-corrosive)

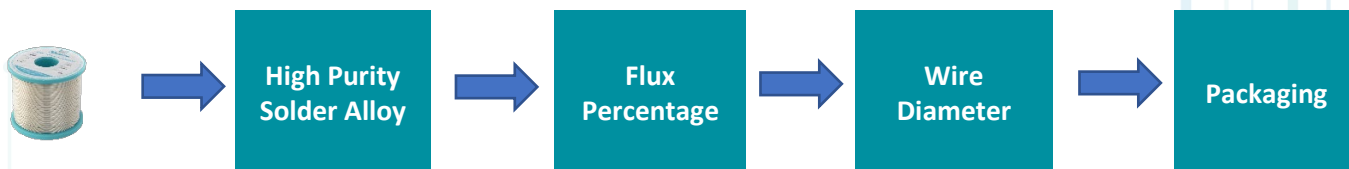
Competitor Type M Flux
(corrosive)



J-STD-004B Surface Insulation Resistance test showing no conductive anodic filament (CAF) migration or dendritic growth after 168 hours at 40°C, 90% relative humidity.

Selecting Nexus Nu-Clear Cored Solder Wire

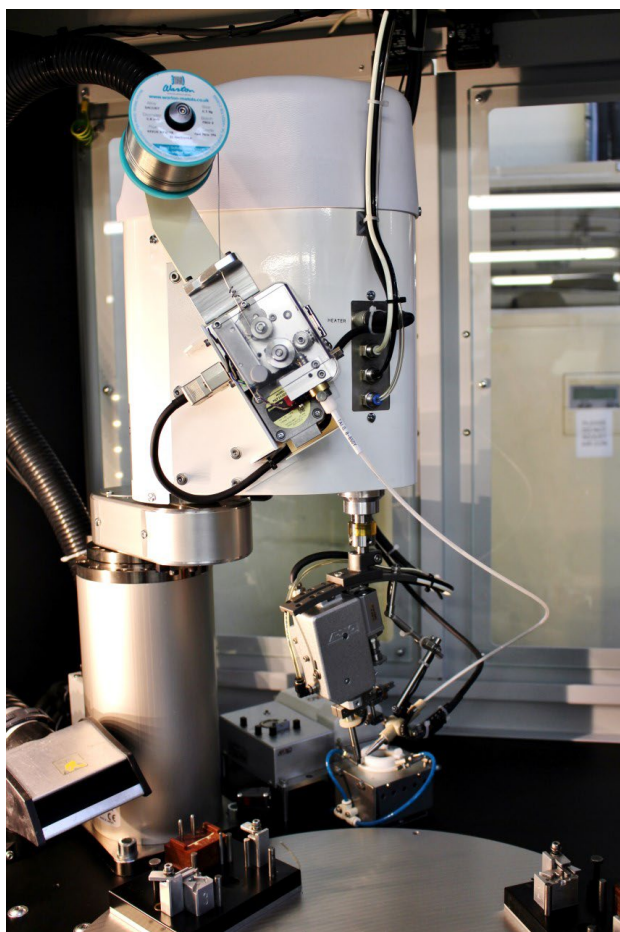
To choose the perfect solder wire for your application select the alloy, flux percentage, wire gauge and packaging.



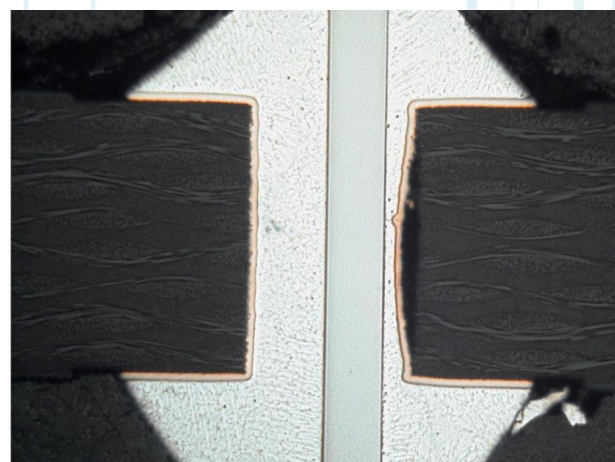
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Application

Nexus Nu-Clear is suitable for hand and robotic soldering applications. Solder wire diameter and soldering iron tip size should be selected to suit the parts/components to be soldered. Soldering irons should provide enough heat for the solder alloy selected. A typical solder tip temperature should be between 120°C and 160°C above the liquidus temperature of the alloy. The ideal temperature will be dependent on the individual assembly. Take care not to overheat the solder as this causes an increase in the depth of inter-metallic layer, which weakens the joint.



Nexus Nu-Clear high-speed robot soldering.



Microsection of Nu-Clear SAC alloy, showing a good even fill and even with poor pin placement.

Commitment to Care

Lead free soldering represents a clear commitment to care for the long-term health of our planet and its inhabitants, by eliminating the use of toxic materials which can leech into the water supply. Nu-Clear Solder Wire is not only formulated without the use of toxic metals such as Lead, Antimony or Nickel, the flux and activation system does not include any known carcinogens or additives which may be damaging to the reproductive health of operators. Unfortunately, some manufacturers and distributors do not share Warton Metals considerate approach to product development and insist on using such additives. Often these additives are only used in a low level, typically ~1-3% within the flux formulation, so ~0.1% within the solder wire, these activators are then not reported in SDS documentation even though used in considerable volume within the flux. Warton Metals offers a commitment to care for users of Nu-Clear by never using such additives, whilst still offering an improvement in performance and reliability. Nexus Solder Wire and Warton Metals insistence on ethical product development allows you to fulfill your commitment to the environment and manufacturing performance whilst offering you peace of mind.

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High Purity Solder Alloy

Standardization is important to reduce variety and to promote the quality of products by defining features and characteristics governing their fitness for purpose. The standards promote clear unambiguous communication between purchasers and suppliers for quotation ordering and supply purposes.

In 1994 a single European standard, EN 29453 (ISO 9453), superseded all other European national standards including: BS 219, DIN 1707, NFC 90-550. Other equivalent international standards include J-STD-006, ASTM B32 and JIS-Z-3382.

Warton High Purity Solder Alloys are manufactured using only the 'Highest Purity Virgin Materials' this being part of Warton's simple philosophy that the best raw materials lead to the best finished products.

Below shows a typical batch analysis of the High Purity Tin/Lead used in manufacturing High Purity 63/37.

Typical batch analysis: Tin

Sn	Sb	Pb	Cu	Zn
99.95	0.009	0.002	0.0002	0.0001
Fe	As	Ag	Bi	In
0.002	0.002	0.0001	0.0001	0.0003

Typical batch analysis: Lead

Sn	Sb	Pb	Cu	Zn
0.001	0.002	99.99	0.003	0.0001
Fe	As	Ag	Bi	In
0.002	0.0005	0.002	0.005	0.0003

Typical batch analysis: Warton High Purity 63/37

Sn	Sb	Pb	Cu	Zn	Fe	As	Ag	Bi	In
63.0	0.0095	remainder	0.0007	0.0002	0.002	0.001	0.0005	0.0003	0.0003

These consistent high standards apply not only to all of Warton's high purity solder alloys, but to its entire range of products, inclusive of flux cored and solid solders, liquid fluxes, cleaners and solder paste.

Lead Free Solder Alloys

In accordance with REACH legislation and increasing environmental awareness Warton Metals offer a complete range of 'lead free' alloys to suit all applications.

Warton's range of lead free solder alloys includes:

Alloy Name	Alloy Breakdown	Melting Temperature °C
Tin	Sn100	232
96S	Sn96.5/Ag3.5	221
96/4	Sn96/Ag4	221
98S	Sn98/Ag2	221-226
TSC	Sn95.8/Ag3.5/Cu0.7	217-218
SAC405	Sn95.5/Ag4/Cu0.5	217-219
SC100e	Cu0.5-0.7/Sn Remainder	227
LM10A	Sn87/Ag10/Cu3	214-275
SACXP0307	Sn/Cu0.7/Ag0.3	217-227
SAC0307	Sn99/Ag0.3/Cu0.7	217-227
SAC305	Sn96.5/Ag3/Cu0.5	217-220
SAC300	Sn97/Ag3	221-224
SAC3	Sn96.7/Ag2.8/Cu0.5	217-220
SAC2	Sn97.5/Ag2/Cu0.5	217-220
SAC1	Sn99.2/Ag0.3/Cu0.5	217-220
97C	Sn97/Cu3	227-310
99C	Sn99.3/Cu0.7	227
95A	Sb4.5-5.5/Sn Remainder	235-240

Key: Sn-Tin, Ag-Silver, Cu-Copper

Other alloys available

Please note that not all alloys are available ex-stock and minimum order quantities may apply.

Leaded Solder Alloys

Warton are able to offer a comprehensive range of leaded solder alloys to 'Professional Users' which will be marked as **For Professional Use Only** in accordance with REACH regulations.

Warton's range of leaded solder alloys includes:

Alloy Name	Alloy Breakdown	Melting Temperature °C
60/40	Sn60/Pb40	183-190
63/37	Sn63/Pb37	183
50/50	Sn50/Pb50	183-215
45/55	Sn45/Pb55	183-226
40/60	Sn40/Pb60	183-238
35/65	Sn35/Pb65	183-245
30/70	Sn30/Pb70	183-255
20/80	Sn20/Pb80	183-280
Alloy 296 HMP	Sn5/Pb92/Ag3	296-301
15/85	Sn15/Pb85	226-290
LMP 62S	Sn62/Pb36/Ag2	179
TLS/5	Sn5/Pb94/Ag1	296-301
HMP 5S	Sn5/Pb93.5/Ag1.5	296-301
Sn10Pb88Ag2	Sn10/Pb88/Ag2	268-290
Alloy No1	Sn50/Pb48.6/Cu1.4	183-215
Alloy No2	Sn60/Pb38.2/Cu1.8	183-190
1/99	Sn1/Pb99	300
60/40 Ant	Sn60/Sb0.2-0.5/Pb Rem	183-188

Key: Sn-Tin, Pb-Lead, Ag-Silver, Cu-Copper, Sb-Antimony

Other alloys available

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Wire gauge (Diameter)

The wire gauge (diameter) for Warton solid and flux cored solder wires is represented as SWG (Standard Wire Gauge). The equivalent imperial and metric values are shown below.

SWG	mm	Inch
10	3.25	0.128
11	2.95	0.116
12	2.64	0.104
13	2.34	0.092
14	2.03	0.080
16	1.63	0.064
18	1.22	0.04
20	0.914	0.036
21	0.813	0.032
22	0.711	0.028
24	0.599	0.022
26	0.457	0.018
28	0.375	0.014
30	0.315	0.012
32	0.274	0.010
34	0.234	0.009
36	0.193	0.008

Other wire diameters available

Not all wire diameters available in all stocking units.

The information supplied in this technical data sheet is designed only as guidance for the safe use and handling of the product. This information is correct to the best of our knowledge and belief at the date of publication however no guarantee is made to its accuracy. This information related only to the specific material designated and may not be valid for such material used in combination with any other materials or in any other process.

