SOLDER WIRES	SOLDER PASTES	SOLDER FLUX	SOLDER BARS
SOLDERING EQUIPMENT	MEASUREMENT AND TESTING SYSTEMS	CONFORMAL COATINGS	ACCESSORIES

KRISTALL 611

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INTRODUCTION:

The newest development from the Stannol R&D team is extending the wide range of available solder wires from our well-established Kristall series. Kristall 611 is a halide activated flux cored solder wire, which opens the process window in many points. Highly reduced flux spitting in combination with a good wetting behaviour on poorly solderable surfaces are the highlights of this new product. Designed for manual rework as well as for automated soldering equipment, it allows one product to cover the different production needs in a modern electronics manufacturing environment. The flux passes the requirements according to the J-STD-004B standards and is classified as an REM1 flux.

- Very low flux spitting
- Leaves just slightly coloured residues
- Fast soldering
- No-Clean
- Chemically modified resin, reducing the health risks of using rosin based fluxes.
- Mild odour

Removal of the residues after soldering is not necessary, as the residues are non-corrosive (see INFOBOX). Is a cleaning required it can be done using alkaline or solvent based cleaning agents like the Flux-Ex200B or Flux-Ex 500. The link to the data sheets of these mentioned cleaners can be found on page 10 of this document.

For safety aspects we kindly ask you to refer to our Safety Data Sheet. The download link can be found also at page 10 of this document.

Tested methods of heat transfer are:

- Laser
- Induction soldering
- Resistance soldering
- Soldering irons *1
- Micro flame *2

*1 We recommend a solder tip temperature of 340-360°C for soldering with a soldering iron. However, the optimum tip temperature and heat capacity required for a hand soldering process is a function of both soldering iron design and the nature of the task and care should be exercised to avoid unnecessarily high tip temperatures for prolonged times. A high tip temperature will increase the tendency for flux spitting and may result in darker flux residues.

Severely contaminated soldering iron tips should first be cleaned and pre-tinned using Stannol Tippy.

*2 Heat transfer by micro flame or plasma is only recommended if there is no direct contact to the solder wire, as this will destroy the resin based flux in very short time.

TRANSPORTATION / STORAGE:

Transport and storage of solder wire is not temperature sensitive. Transportation time should be limited to the required minimum. Transport temperatures for some days of -20°C to +80°C can be tolerated and will show no influence on the properties or behaviour of the solder wire. Storage at dry room temperature (0-40°C) is recommended. STANNOL flux cored solder wires are not limited shelf life items.

INFOBOX

FLUX CLASSIFICATION ACCORDING TO J-STD 004B

The test methods described in the standard are used to categorize fluxes for their properties under standardized conditions. Depending on the results, the fluxes are divided into the categories L, M and H. The following number indicates whether the flux contains halide (1) or is halide-free (0). If all tests are passed in the uncleaned state, the products are generally referred to as No-Clean products. However, this designation only indicates that the respective products have passed the tests in the uncleaned state.
The test conditions, however, do not cover all possible environmental conditions that a PCB can experience in the field. The final risk assessment of the residues and the associated decision as to whether the flux residues must be removed by cleaning after the soldering process is always the responsibility of the electronics manufacturer.

HANDLING GUIDELINES KRISTALL 611

As technical cleanliness is becoming more and more important, this was one of the main focus during the development of Kristall 611. To reduce contamination with flux residues due to flux spitting during soldering was therefore the most important goal. This, beside many others, was achieved by choosing the best possible chemically modified resins in terms of low spitting behaviour. This Kristall 611 by far outperforms most other solder wires in wetting and spitting behaviour.

When comparing the pictures on the right side you can see that the contamination and spitting of comparable solder joints is much lower when using the Kristall 611.

The following surfaces show a good wetting in combination with the Kristall 611 solder wire:

- Copper
- OSP
- Brass
- Tin
- Chem. Tin
- Silver
- Chem. Silver
- Nickel
- Iron
- ENiG
- Nickel silver

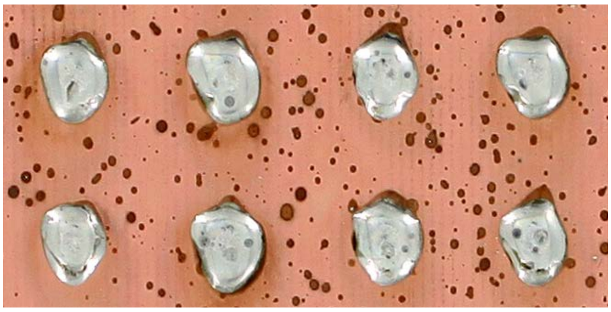
Test & soldering method
The solderjoints on the pictures on the right, were produced under the following test conditions.
Temperature = 360°C
Surface = bare copper (FR4)
Heat transfer = soldering iron

Specially soldering robot with intigreadet solder wire feeding unit adopted to the labotory requirements.

Contamination Kristall 611

Contamination conventional solder wire

Spitting Kristall 611



Spitting conventional solder wire

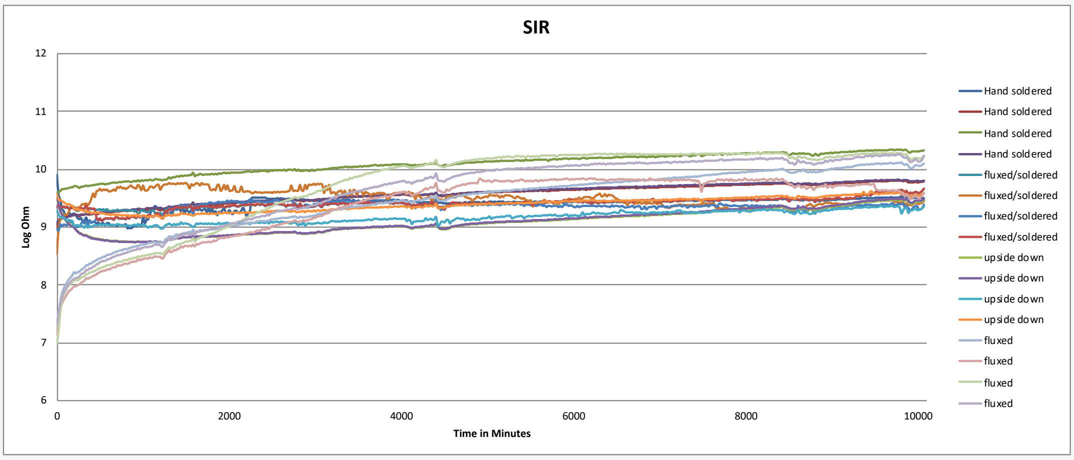
SURFACE INSULATION RESISTANCE (IPC-TM-650, METHOD 2.6.3.3 / 2.6.3.7)

INTRODUCTION:
The acronym SIR stands for Surface Insulation Resistance. SIR is defined as the electrical resistance of an insulating material between a pair of contacts, conduc- tors or grounding devices and that is determined under specified environmental and electrical conditions.

TEST CONDITIONS:
Test board: 400-200µm comb,
Bare Cu on FR-4 base material
Environment: 40 ± 1°C, 90 ± 3%rH
Measurement range: up to 10^{13} Ohm with bias 5VDC
Test duration: 168h (7 days)

EVALUATION:
The criteria for passing the SIR test are:

- All SIR measurements on all test patterns shall exceed the 100 MOhm requirements.
- There shall not be evidence of electrochemical mig- ration (filament growth) that reduces the conductor spacing by more than 20%.
- There shall not be corrosion* of the conductors. *Note: Minor discoloration of one pole of the comb pattern conductors is acceptable.



Results: After 168h >10^{8} Ohm PASS

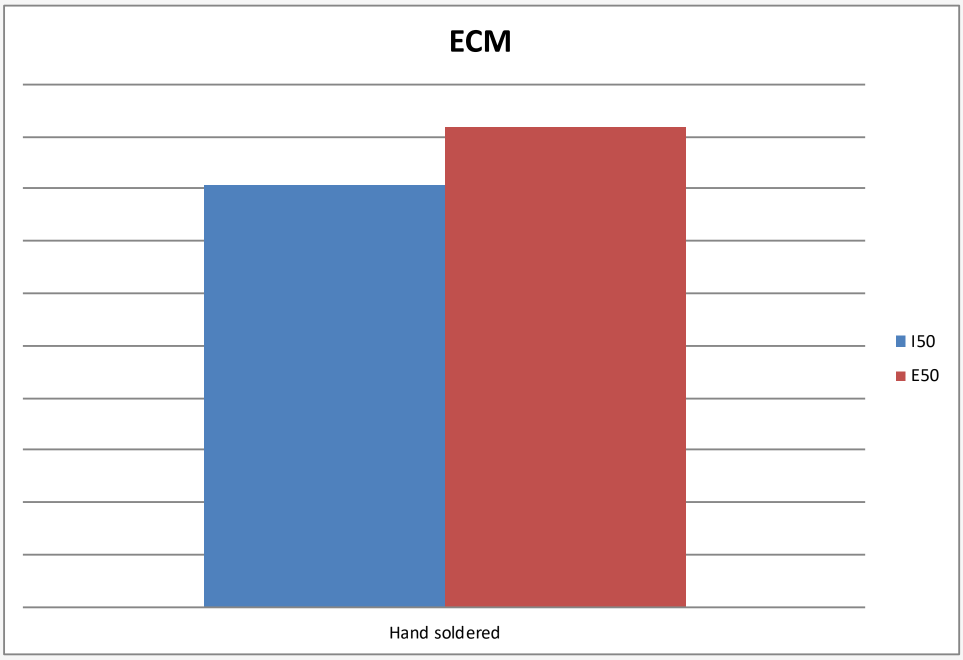
ELECTRO-MIGRATION TEST (IPC-TM-650, METHOD 2.6.14.1)

INTRODUCTION:
The acronym ECM stands for Electrochemical Migration. ECM is defined as the growth of conductive metal filaments under the influence of a DC voltage bias where growth is by electro-deposition from a solution containing metal ions that are dissolved from the anode, transported by the electric field and redeposited at the cathode and specifically excludes phenomena such as field induced metal transport in semiconductors and diffu- sion of the products arising from metallic corrosion.

TEST CONDITIONS:
Test board: IPC-B-25A Pattern D,
Bare Cu on FR-4 base material
Environment: 65 ± 2°C, 88,5 ± 3,5%rH
Measurement range: up to 10^{13} Ω with bias 10VDC
Test duration: 596h (25 days)

EVALUATION:
The I50 or initial insulation resistance, is the data measurement taken after a 96 hour stabilization period. The IR-initial, the daily IR measurements and the final insulation resistance E50 (IR-final) measurement values shall be reported according to the test method. The criteria for passing the ECM test are:

- The IR-final ⩾ IR initial/10. That is, the IR shall not degrade by more than one decade, as a result of the applied bias.
- There shall not be evidence of electrochemical migration (filament growth) that reduces the conductor spacing by more than 20%.
- There shall not be corrosion* of the conductors. *Note: Minor discoloration of one pole of the comb pattern conductors is acceptable.



Results: No electrochemical migration. The final IR is ⩾ the initial IR PASS

COPPER CORROSION (IPC-TM-650, METHOD 2.6.15)

INTRODUCTION:
This test method is designed to determine the corrosive properties of flux residues under extreme environmental conditions.

TEST CONDITIONS:
Test Coupon: 50 x 50 x 0.5mm pure copper sheet
Environment: 40 ± 1°C, 93 ± 2%rH
Test duration: 240h (10 days)

EVALUATION:
No Corrosion: No evidence of corrosion is observed. Any initial change of color, which may develop when the test panel is heated during soldering.
Minor Corrosion: Discrete white or colored spots in the flux residues or a color change to green-blue without pitting of copper.
Major Corrosion: Development of green-blue discoloration/corrosion with observation of pitting of the copper panel.

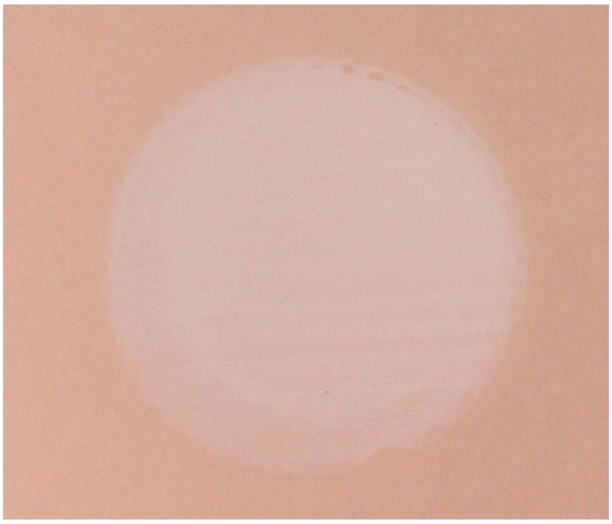
Results: Copper corrosion (Classified=L)

COPPER MIRROR (IPC-TM-650, METHOD 2.3.32)

INTRODUCTION:
This test method is designed to determine the removal effect the flux has on the bright copper mirror.

TEST CONDITIONS:
Test Coupon: Copper sheet 0.5mm thickness,
Cu-ETP, condition HA
Environment: 23 ± 2°C, 50 ± 5%rH
Test duration: 24h (1 day)

EVALUATION:
L = Only if there is no complete removal of the copper film.
M = If there is complete removal of the copper only around the perimeter of the drops (less than 50% breakthrough).
H = If the copper film is completely removed (greater than 50% breakthrough).



Results: No Breakthrough = PASS
(Classified=L)

ACIDE VALUE
(IPC-TM-650, METHOD 2.3.13)

INTRODUCTION:
This test method is designed to determine the acid value in the production process for internal specification.

METHOD:
Method is described in the IPC-TM-650 Method 2.6.13
Method B is used.

RESULTS:
Result: 160 mgKOH/g

QUANTITATIVE HALIDES
(IPC-TM-650, METHOD 2.3.28.1)

INTRODUCTION:
Quantitative halide test shall be used to determine the concentration of Chloride (Cl-), Bromide (Br-), Fluoride (F-) and Iodide (I-) in liquid fluxes or extracted flux solutions.

TEST CONDITIONS / EVALUATION:
Method is described in the IPC-TM-650 Method 2.3.28.1
HPLC is used.

RESULTS:
Result: 0.69%

SUPPLY FORMS

TITEL	ALLOY	DIAMETER	WEIGHT
KRISTALL 611	Flowtin TSC305 F	0.5 / 0.7 / 1.0 mm	500 g
KRISTALL 611	Flowtin TC F	0.5 / 0.7 / 1.0 mm	500 g

Further articles available on request

DOWNLOADS

SAFETY DATA SHEET
DOWNLOAD Kristall 611 Flowtin TSC305 F
DOWNLOAD Kristall 611 Flowtin TC F

SHELF-LIFE
DOWNLOAD

ROHS
DOWNLOAD

REACH
DOWNLOAD

CATALOGUE
DOWNLOAD

TECHNICAL DATASHEET FLUX EX-500
DOWNLOAD

TECHNICAL DATASHEET FLUX EX-200B
DOWNLOAD

STANNOL

TRADITION AND INNOVATION.

SOLDERING TECHNOLOGY SINCE 1879 – MADE IN GERMANY


SOLDER WIRES

FLUXES


SOLDERING STATIONS

SOLDER PASTES

ACCESSORIES


SOLDER BARS

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