STANNOL®

Wenn's ums Löten geht
When it's about soldering
Quand il s'agit du soudage

Technical Data Sheet

STANNOL® liquid flux X32-10i

halide-free, no residue flux

- **No cleaning - reduces costs and eliminates CFC usage**
- **No residues to interfere with ATE probes - without cleaning**
- **Wide operating window**
- **High surface insulation resistance - without cleaning**
- **Non corrosive - safer than RMA fluxes**
- **Fast soldering on conventional leaded and SMD components**
- **No bridges or icicles**

Description

STANNOL® X32-10i is a no residue halide free flux with a wider operating window from the pioneers of 'no clean' technology.

Application

Recommended for consumer electronics and telecommunications use and for professional applications with conformal coatings.

Recommended Operating Conditions:

The Printed Circuit Board: **STANNOL® X32-10i** is recommended for use on clean copper or tin-lead coated PCBs. Specifying the use of a copper circuit preservative will ensure better soldering and excellent post-soldering cleanliness. **STANNOL® X32-10i** will solder satisfactorily over most rosin-based surface preservatives but the rosin residues from the preservative will reduce board cleanliness unless cleaning is employed. It is recommended that the rosin based preservative be applied no longer than 3 months before soldering with **X32-10i**.
STANNOL® X32-10i has been formulated to work over a wide range of solder resists. The solvent system in **STANNOL® X32-10i** is designed for optimum wetting of surfaces but prolonged contact with polystyrene, polyester or polycarbonate is not recommended.

Machine Preparation: When switching to **X32-10i** from any other flux, ensure all fingers, pallets and conveyors are thoroughly cleaned. It may be necessary to steam clean the equipment to remove all residues.
It is recommended that **STANNOL® Flux-Ex 200/B** solvent cleaner be used in the finger cleaners.

Fluxing: **STANNOL® X32-10i** has been formulated for use in foam, spray or wave fluxers in the same way as ordinary fluxes on standard wave soldering machines. The upper limit for flux coverage to ensure that soldered PCBs pass cleanliness tests is 25g/m^2 of circuit. Good soldering can be achieved at half this volume. It is important to remove excess flux from the circuit boards using the standard air knife or brushes supplied on the wave soldering machine. An air pressure of about 5-7psi is recommended and the nozzle should be about 25mm below the board and angled back at a few degrees to the perpendicular to the plane of the board. This will ensure effective removal of excess flux without transferring droplets to the top of the following board. Sufficient space should be allowed between the foam fluxer and the air knife to prevent the air stream disturbing the foam. Observing the following instructions will help ensure optimum foaming and soldering results.

1. Use DRY AIR.
2. Keep the flux tank FULL at all times.
3. The top of the foaming stone should be no more than 20mm below the surface of the liquid flux. A fine foaming stone is preferred and if necessary, the level of the stone should be raised.
4. The preferred width of the slot (opening) of the foam fluxer is 10mm. If it is wider, add a strip of stainless steel or PVC across it to narrow the opening to 10mm. It is preferable to have a chimney for the foam which tapers towards the top.
5. DO NOT use hot fixtures or pallets as these cause the foam to deteriorate and increase losses by evaporation.
6. DO NOT use fixtures which have the potential to entrap flux.

Flux Control: Control of the flux concentration is achieved in the normal manner by measuring the temperature and specific gravity of the flux. A nomograph is available to show how these measurements are related to the corrective action needed.
The specific gravities of the flux and thinners are similar and they vary with their water contents. As a result, flux concentration control by measurement of the acid value is more convenient. The **STANNOL® Mini-Titration-Kit** for use at the production line is available.

Preheating: As **STANNOL® X32-10i** contains more solvent than conventional fluxes, it will be necessary to increase the preheat settings to remove the additional solvent and to ensure that the flux is properly activated. The optimum preheat temperature and time for a PCB depends on its design and the thermal mass of the components but the cycle should be sufficient to ensure that the flux coating is not visibly wet when it contacts the wave.
The combination of very low resin content and special solvent blend produce a wider operating window compared with other low solids content liquid fluxes. Conditions will vary from one machine to another but the following settings give good results on a number of systems:

Conveyor Speed	m min^{-1}	1.22	1.52	1.83
Topside Preheat	°C	82-85	93-99	99-104

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It is advantageous to fit a topside canopy over the preheaters to produce more effective drying and activation. This will allow the use of faster conveyor speeds and improve soldering. At a speed of 1.5m/min, a contact length of 38-50mm between the wave and the PCB is recommended. At lower speeds, this contact length should be reduced. Very slow speeds through the solder wave may produce dull solder joints. It is particularly useful when setting up a machine to measure the preheat using the **STANNOL® Thermologger 5000.**
It is important that flux solvent be removed by the preheat and that the PCB is not visibly wet when it reaches the solder wave.

Solders: **STANNOL® X32-10i** flux can be used with all standard solder alloys. The recommended maximum solder bath temperature is 260°C (500°F). The solder bath temperature can generally be reduced compared with processes using conventional fluxes. Temperatures as low as 235°C (455°F) may be used in some situations and this results in improved soldering and less wastage through drossing. Dwell time on the wave should be 1.5-2.5 seconds. Conveyor speed for dual wave systems should be at least 1.2m/min.

Cleaning: **STANNOL® X32-10i** flux properly applied and processed leaves no discernible residues without cleaning. It is recommended that the soldering system itself be tested for cleanliness using an unfluxed board passed over the soldering machine. Suppliers should be requested to supply clean components and clean boards with good solderability. Special applications may have regulations insisting on board cleaning and in such cases **STANNOL® Flux-Ex500** Solvent Cleaner should be used. These are economic cleaners which are free from CFC compounds and may be used to remove any small accumulation of flux solids that might develop on parts of the soldering machine after prolonged use. Machine contamination will in any case be much less than with conventional rosin fluxes. Unlike water soluble fluxes, **STANNOL® X32-10i** flux is not corrosive towards PCB-handling equipment.

Physical Data and Properties and Data

General Properties	X32-10i
Colour	colourless
Smell	alcoholic
Solids content	2.5 ± 0.5% w/w
Halide content	Zero
Acid value (on liquid) mg KOH/g	16 ± 0.5
Specific gravity at 25°C (77°F)	0,812 ± 0,002
Flash point (Abel)	12°C (53°F)
ISO 9454 classification	2.2.3.A
ANSI JSTD 004 classification	P
IPC classification	M3CN
EN 29454 classification	2.2.3.A

Special Properties: Boards soldered with **STANNOL® X32-10i** flux pass MIL-P-28809A ionic contamination test without cleaning provided excess flux is not applied and a clean system and components are used.

Corrosion: **STANNOL® X32-10i** flux passes the following corrosion tests:
USA Copper Mirror Test per MIL-F-14256D / UK Ministry of Defence DTD 599A / USA Bellcore TR-TSY-000078

Surface Insulation Resistance: **STANNOL® X32-10i** flux gave the PASS results shown in the following table during SIR tests:

Surface Insulation Resistance Measurements onu Combs						
Specification	**Ageing Conditions**					Typical SIR (ohms)
	Temp (°C)	Humidity (%)	Time (h)	Voltage (V)	Test-Voltage (V)	
Bellcore TR-TSY-000078	35	90	96	50	100	6.5×10^{10}
Bellcore TA-NWT-000078	35	85	96	50	100	3.4×10^{11}
JIS-Z-3197	40	90	96	None	500	5.2×10^{10}

Conformal Coatings: Extended surface insulation resistance tests using conformally coated IPC-B-25 type B test combs were carried out at 85°C and 85% RH and a test voltage of 100V DC. The following table shows that conformal coatings perform well over uncleaned **X32-10i** residues compared with the same coatings over cleaned, unfluxed boards.

Flux Type	Conformal Coating	Surface insulation resistance (ohms) after 168 hours
None **X32-10i**	Acrylic	1.75×10^9 1.20×10^9
None **X32-10i**	Modified Silicone	2.13×10^9 1.19×10^9

Thinner: **STANNOL® VD-500**

Shelf life: 2 years after date of delivery (provided proper storage in originally sealed container).

Health and Safety

Before using please read the material safety data sheet carefully and observe the safety precautions described.

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