STANNOL®

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

# Technical Data Sheet

# STANNOL® liquid flux X33-08i

## no clean, halide-free sustained activity flux

- **Sustained activity for maximum process window**
- **Foam, spray or wave application**
- **Resin free to give clean appearance to soldered PCB**
- **No clean-reduces costs and eliminates CFC usage**
- **Minimal residues to interfere with ATE probes without cleaning**
- **Compatible with rosin based preservatives**
- **Fast soldering on conventional leaded and SMD components**
- **Shiny joints; no bridges or icicles**

## Description

**STANNOL® X33-08i** is a resin free, no clean, halide free liquid flux for surfaces with poor solderability from the pioneers of 'no clean' technology.

## Applications

**STANNOL® X33-08i** is recommended for consumer electronics and general electrical soldering applications. It has been formulated without resin/rosin to give a very clean appearance to PCBs.

## Recommended Operating Conditions

**The Printed Circuit Board:** **STANNOL® X33-08i** is recommended for use on clean copper or tin-lead coated PCBs. It will solder satisfactorily over most rosin-based preservatives. It is recommended that the rosin based preservative be applied no longer than 3 months before soldering, since the period of protection is limited dependent on storage conditions. **STANNOL® X33-08i** has been formulated to work over a wide range of solder resists. The solvent system in **STANNOL® X33-08i** is designed for optimum wetting of surfaces but prolonged contact with polystyrene, PVC or polycarbonate is not recommended.

**Machine Preparation:** When switching to **STANNOL® X33-08i** from any other flux, ensure all fingers, pallets and conveyors are thoroughly cleaned. It is recommended that **STANNOL® Flux-Ex 200/B** Cleaner be used in the finger cleaners.

**Fluxing:** **STANNOL® X33-08i** has been formulated for use in foam, spray or wave fluxers in the same way as ordinary fluxes on standard wave soldering machines. 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. DRY AIR.
2. Use Keep the flux tank FULL at all times.
3. The top of the foaming stone should be no more than 2cm below the surface of the liquid flux. A fine foaming stone is preferred and if necessary, raise the level of the stone.
4. The preferred width of the slot (opening) of the foam fluxer is 10mm. If it is wider and problems are encountered, 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 that have the potential to entrap flux.

**Flux Control:** Control of the flux concentration can be achieved in the conventional manner by measuring temperature and specific gravity. However, as the specific gravities of the flux and thinners are similar and will vary with water content, flux concentration control by measurement of acid value is more convenient and accurate. The **STANNOL® Mini-Titration-Kit** for use at the production line is recommended for this purpose.





STANNOL GmbH
Oskarstraße 3-7 • 42283 Wuppertal • Tel. +49 (0)202-585-0 • Telefax +49 (0)202-585111 • E-Mail info@stannol.de • Web www.stannol.de

**Preheating:** The optimum preheat temperature and time for a PCB depend 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.
Conditions will vary from one machine to another but the following settings were found to give good results on a number of systems:

| | | | |
|---|---|---|---|
| **Conveyor Speed** | m $min^{-1}$ | 1.22 | 1.52 |
| **Topside Preheat** | °C | 80-85 | 90-95 |

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 $min^{-1}$, 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® X33-08i** flux can be used with all 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 $min^{-1}$.

**Cleaning:** Special applications may have regulations insisting on board cleaning and in such cases **STANNOL® Flux-Ex 200/B** Solvent Cleaner should be used. This is an economic cleaner which is 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® X33-08i** flux is not corrosive towards PCB handling equipment.

## Physical Data and Properties and Data:

| General Properties | X33-08i |
|---|---|
| **Colour** | colourless |
| **Smell** | alcoholic |
| **Solids content** | 1.8 - 2.2% |
| **Halide content** | Nil |
| **Acid value (on liquid) mg KOH/g** | 16 - 19 |
| **Specific gravity at 25°C (77°F)** | 0.805 ± 0.002 |
| **Flash point (Abel)** | 12°C (53°F) |
| **IPC Classification** | L3CN |
| **J-STD-004** | OR L0 |
| **DIN EN 29454-1** | 2.2.3 |

**Special Properties: STANNOL® X33-08i** flux passes the following corrosion tests:
USA Copper Mirror Test per MIL-F-14256D / UK Ministry of Defence DTD 599A / IPC-SF-818 Flux Class 3 / BS 5625 Flux Class 4

**Surface Insulation Resistance: STANNOL® X33-08i** gave the **PASS** results shown in the following table during surface insulation resistance tests.

| Surface Insulation Resistance Measurements on uncleaned Combs | | | | | | |
|---|---|---|---|---|---|---|
| **Specification** | **Ageing Conditions** | | | | | Typical SIR (ohms) |
| | Temp (°C) | Humidity (%) | Time (h) | Voltage (V) | Test-Voltage (V) | |
| **Bellcore TR-NWT-000078 Issue 3** | 35 | 85 | 96 | 50 | 100 | $4.4 \times 10^{11}$ |
| **J-STD-004** | 85 | 85 | 168 | 50 | 100 | $1.4 \times 10^{10}$ |

**Electromigration: STANNOL® X33-08i** passes the electromigration test requirement of Bellcore TR-NWT-000078 at 10V bias for 500 hr at 85°C and 85% RH.

**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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