



STANNOL®

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

## Technical Data Sheet

# STANNOL® Liquid Flux WF203 VOC-free and no-clean

### Product Features

- ✓ No-Clean formulation
- ✓ Leaves electrical safe residues - no removal of residues required
- ✓ For all available lead free alloys / solders
- ✓ Application with spray fluxer
- ✓ Non-flammable formulation - <1% VOC - meets US air quality legislation
- ✓ Reduces the number of solder balls (compared to many other water based fluxes)
- ✓ Ensures a good wetting on surfaces and in through holes

### Description

**STANNOL® WF203** is a water-based, halide-free and low-solid flux that helps to reduce emissions of volatile organic compounds (VOC).

### Application

**STANNOL® WF203** was designed mainly for industrial electronics manufacturing for the use on conventional or nitrogen inerted wave soldering machines. This flux ensures even on oxidized copper surfaces an excellent activity. It has been designed to minimise the effect of solder balling between adjacent pads.

### Recommended Operating Conditions

**Printed Circuit Board:** **STANNOL® WF203** has been formulated for high activity on oxidized copper and most commonly used surface preservative materials (HAL, OSP, Ni/Au, chem. Sn and chem. Ag). The flux ensures a good filling of the through holes in THT.

**Machine Preparation:** Before changing over to using WF203 please ensure the solder equipment is thoroughly cleaned, including all fingers, pallets and conveyors, so that any possible contamination has been removed. **STANNOL® Flux-Ex 200B** can be used in the finger cleaners.

**Fluxing:** **STANNOL® WF203** has been specially formulated for use in spray fluxer only. To achieve a very clean PCB after soldering, set the volume of the spray fluxer to 15-25ml/min. This value can only be a recommendation and may vary within different wave solder equipments.

**Flux Control:** As the flux **STANNOL® WF203** has been designed to be applied by closed spray fluxing units only, there is no change in density and/or acid value. In special cases a control of the acid value and addition of deionized water can be done using the **STANNOL® Mini-Titration-Kit** (flux concentration test kit).

**Note:** The flux should not be stored below +10°C (long-time-storage). For a short time storage temperatures of +5°C might be acceptable without risks of flux degradation. Lower temperatures may cause the solids to crystallize and form a solid layer inside the container. If this happened, you can try to get the solids back into solution by consistently stirring and heating it to room temperature.



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**Preheating:** As STANNOL® WF203 is based on water, it is necessary to adjust the preheat settings to ensure the water is sufficiently evaporated prior to the PCB entering the solder wave. A minimum temperature according to the below listed chart ensures, the flux can react properly by removing oxides (see topside pre-heat table below). The optimum preheat temperature for a PCB depends on its design and the thermal mass of the components used, but the preheat temperature and time should be set properly to ensure that the solder side of the PCB is not visibly wet when it hits the liquid tin of the wave.

Preheat vs. conveyor speed combinations which have given good results are shown below.

<b>Conveyor Speed</b>	m/min.	0.8	1.2
<b>Topside Preheat</b>	(°C)	120	130

Fitting a topside canopy over the preheat areas can help to ensure a more effective drying and activation. This may allow using faster conveyor speeds and improved soldering.

**Wave Soldering:** Excess moisture on the PCB during soldering may lead to random solder balling and poor wetting of some solder joints. IT IS IMPORTANT that the flux solvent carrier (water) is fully evaporated and that the PCB appears virtually dry when it reaches the solder wave. At a speed of 1.20-1.50m/min, a contact time of approx. 1.5-3 sec is recommended. Very long contact times may produce dull solder joints.

For accurate preheat and peak temperature measurements when setting up a wave solder machine, and consistent process monitoring we recommend to use the STANNOL® Thermologger 5000 temperature profile system.

## Physical Data and Properties and Data:

General Properties	WF203
Colour	Clear, colourless liquid
Solids content	3.5%
Halide content	zero
Acid value (on liquid)	33.3 mg KOH g <sup>-1</sup>
Specific density at 25°C (77°F)	1.009 g/cm <sup>3</sup>
Recommended thinner	no thinner required
J-STD-004 classification	OR M0
DIN EN 29454-1 classification	2.1.3.A

**Surface Insulation Resistance:** STANNOL® WF203 liquid flux passes the J-STD-004 surface insulation resistance test without cleaning.

**Corrosion:** STANNOL® WF203 liquid flux PASS the IPC-TM-650 copper mirror test (method 2.3.32) when the solids are reconstituted in 2-propanol (J-STD-004).

## Shelf life

1 year 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.

The mentioned values are typical and represent no form of specification. The Data Sheet serves for information purposes. Any verbal or written advise is not binding for the company, whether such information originates from the company offices or from a sales representative. This is also in respect of any protection rights of third parties, and does not release the customer from the responsibility of verifying the products of the company for suitability of use for the intended process or purpose. Should any liability on the part of the company arise, the company will only indemnify for loss or damage to the same extent as for defects in quality.