



# NITROGEN ASSISTED SOLDERING PRESS RELEASE



## NITROGEN ASSISTED SOLDERING

Lead-free solders do not behave or look like their lead containing counterparts. As our industry changes over to lead-free solders, individual PCB assemblers will need to address several issues relating to hand soldering and rework. These issues include:

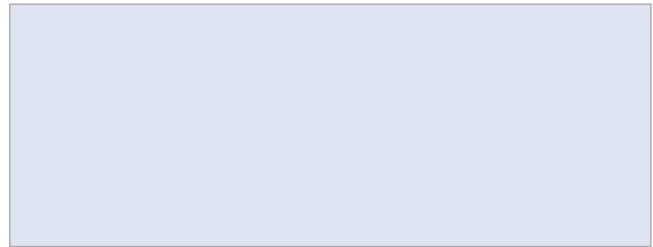
- Higher melting temperatures which mistakenly lead to operators increasing equipment operating temperatures. Higher operating temperatures do not make the process quicker, they actually slow it down.
- Poor wetting and spreading properties - Additional time is required when working with lead free solders, they do not spread or wet like lead containing solders do. Operators must slow down.
- Difficult to work with - Bridging and insufficient solder defects are common, even for experienced operators, leading to operator frustration.
- Dull grainy finish - makes inspection difficult.

Because lead free solders oxidize quickly, more aggressive and longer lasting fluxes are required to keep surfaces clean and free from oxidation. Working with no-clean fluxes is challenging as their process window is often small. Once they are gone, oxidation immediately begins to form which can result in a marginal or defective solder joint. Additionally, increasing operating temperatures creates an ideal environment for oxidation to form and will also lead to flux and solder ball splatter on the PCB. If the flux is splattered all over the PCB, it's not able to do its job on the surfaces to be joined during the soldering process.

Lead Free solders also affects soldering and rework tools and their effect is detrimental. Lead free solders contain high percentages of tin, almost always over 94%. Tin is a corrosive and active metal. When it mixes with iron (the protective layer on soldering tips), an inter-metallic compound is formed that wears away more quickly than the iron would either by itself or when used with lead containing solder. This causes two problems, one is shorter tip life as the protective iron coating is dissolved in the tin, and the second is that oxidation forms more quickly which is further exacerbated by the high temperature environment the tips work in. As a result, tin oxides form and create an inter-metallic compound with the iron plating on the tip. Once the oxidation begins to form, the tip will lose its ability to wet with solder and if not cleaned off quickly, it becomes almost impossible to remove and the tip must be replaced.

The use of nitrogen assisted soldering equipment helps to mitigate the problems associated with using lead-free solders. Nitrogen helps on two fronts. First, it creates an inert environment around the soldering tip, reducing the potential for the tip to oxidize. Second, it assists in the soldering process at the PCB level by purging oxygen from the immediate area which reduces or eliminates the formation of oxidation from the work site. This not only reduces the amount of flux that is required, but it also helps to improve wetting, spreading, and leaves a finish that is shinier and less grainy.

## N<sub>2</sub> PASSING THROUGH HEATER



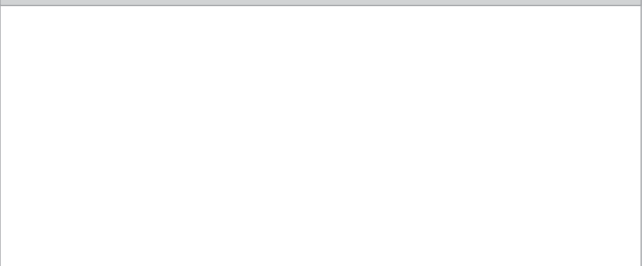
PACE's nitrogen assisted soldering systems pass the nitrogen through or around the heater before it is directed to the work site. This "preheats" the immediate area which can also help to reduce thermal shock to component leads and to components themselves. Pre-heating also allows for the use of lower, safer, and more effective soldering temperatures.

### TD-100N



PACE is pleased to offer two world class soldering irons with nitrogen soldering capability. The first is PACE's world renowned tip heater cartridge soldering iron, the TD-100N - ThermoDrive Iron. The TD-100N is available in either 4 pin or 8 pin configurations. The TD-100N can be used with many of our soldering systems when accompanied with the N<sub>2</sub> Regulator Accessory (P/N 6993-0271-P1). The N<sub>2</sub> Regulator can be mounted to any PACE system that is made in an extruded case.

### ST 45N



The second is the PS-90N which can be used with any compatible system in an extruded case with the N<sub>2</sub> Regulator Accessory (P/N 6993-0271-P1). It also comes standard with the ST 45N system. The ST 45N has all of the great features of the ST 45 with the addition of an air fitting on the back to connect the system to an N<sub>2</sub> source and an adjustable port on the front panel to adjust the N<sub>2</sub> flow to meet your specific needs.

ST 45N 120 VAC Part Number: 8007-0346

ST 45N 230 VAC Part Number: 8007-0347



# NITROGEN ASSISTED SOLDERING

To use the N<sub>2</sub> regulator accessory, an N<sub>2</sub> source must be connected to it. Flow rates can be regulated between 1 and 10cfm. See chart below for system and handpiece compatibility

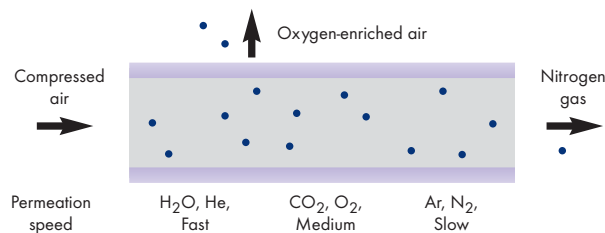


IMAGE: N2 REGULATOR ACCESSORY TO GO IN THIS AREA

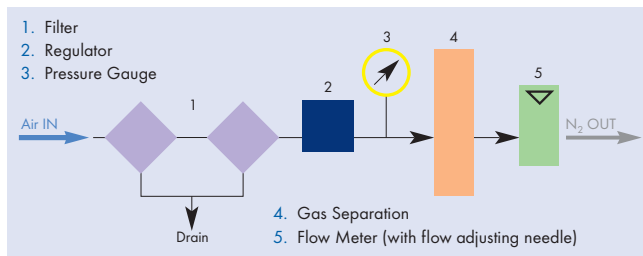
	<b>TD-100N, 4 Pin</b> 6993-0273-P1 (kit) 6010-0155-P1 (handpiece only)	<b>TD-100N, 8 Pin</b> 6993-0273-P1 (kit) 6010-0155-P1 (handpiece only)	<b>PS-90N, 4 Pin</b> 6993-0275-P1 (kit) 6010-0116-P1 (handpiece only)	<b>PS-90N, 8 Pin</b> 6993-0274-P1 (kit) 6010-0157-P1 (handpiece only)	<b>N<sub>2</sub> Regulator Accessory required</b> (6993-0271-P1)
HW 50	▲				▲
TW 50	▲				▲
MBT 350		▲		▲	▲
ST 25			▲		▲
ST 45			▲		▲
ST 45N			▲		
ST 125			▲		▲
ST 145			▲		▲

PACE is also pleased to offer the NF 500 and NF 1000 nitrogen farms. Nitrogen farms harvest N<sub>2</sub> from a compressed air supply that is passed through a specialized filter. The other atoms that make up "air" are forced through the filter, leaving a pure stream of N<sub>2</sub> as the product of filtering. Nitrogen farms are passive collection devices which means that there are no electrical or moving parts, little or no maintenance, low running costs, and they maintain the balance of air/N<sub>2</sub> in a confined space (as long as the compressed air is pulled from the same space).

## FILTERING PROCESS



## NITROGEN FARM FLOW SHEET



NITROGEN FARM	SPECIFICATIONS
NF 500 Part Number	8110-0001
NF 1000 Part Number	8110-0002
Number of Irons: NF 500	2
Number of Irons: NF 1000	Up to 10
Air Requirement	5-7 Bar (72-102 p.s.i.)
Dimensions NF 500	420mm H x 180mm W x 220mm D (16.8" H x 7.2" W x 8.8" D)
Dimensions NF 1000	720mm H x 270mm W x 300mm D (28.8" H x 10.8" W x 12" D)
Weight NF 500	Approx. 8.5 Kg (18.7 lbs.)
Weight NF 1000	Approx. 18.0 Kg (39.7 lbs.)

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