SHANGHAI – I've been coming to China since early 2000, and every trip here reveals something new.

On the outside, for example, where I was once something of an oddity – while walking the Bund, Chinese nationals would approach to touch my hair – Westerners are everywhere today. Indeed, English signage is so rampant, I joked with local friends that while they may end up with all our manufacturing, they'll also end up with our language. (They don't think that's very funny.)

After three days inside the trade show halls of Nepcon China, we can begin to add up the totals: 13 printers, one (axial component) placement machine, 14 reflow ovens, 10 wave machines, 10 AOI, four x-ray machines, one XRF, three ICT, three routers, five SPI systems, two dispensers, and a smattering of others (e.g., routers, stencil cleaners, washers, soldering robots). There's an extraordinary range of microscopes, ESD carts, rework stations (including BGA). Keep in mind, that's just the Chinese-made gear. The learning curve is clearly shortening.

And everyone is making everything. Companies you've heard of (e.g., **Folungwin**) and companies you haven't (

Tolo Machinery Equipment, Nanjing Panda

) were demonstrating a range of machines from wave to reflow to AOI to printers. All-in-one is the rage.

Some improvements were noticeable. Folungwin's printer, for example, was made from very high quality components and sturdy frames, not the weak sheet metal that once was commonplace. All the AOIs now feature color cameras. And a couple of solder vendors – ShenMao and Almit – are clearly intent on becoming world players.

Generally speaking, what the native equipment is not is yet ready for volume. For example, none of the SPI was inline, and two were tabletops. And the components for many of the soldering machines are still substandard.

Accusations of IP theft, as usual, were rampant. I saw direct copies of various **DEK, EKRA** and

Vitronics

machines, and a dead-on knockoff of

Ovation's

Grik-Lok board support tool, among others. One irony was the "no photography" signs perched on certain Chinese-made machines. Western buyers beware.

As usual, distribution dominates. Those companies that develop strong ties to the top distributors tend to do the best, as while from a business standpoint China is fairly easy to get into, actually developing leads and making sales is an altogether different story. The top distributors at Nepcon China – including **WKK, Kaison** and **AmericanTec** – outshone all but the largest of the placement OEMs.

Perhaps surprisingly, interest in cleaning has ramped here over the past few years. The best guess is that Southeast Asia's high volumes of Pb-free material use – and its accompanying higher soldering temperatures – results in baked-on residues that are hard to remove and in turn force local manufacturers to migrate to more aggressive solutions. Companies like **Aqueous Technologies, Zestron**

and

Kyzen

were all very positive about their opportunities here over the next few years.

The Chinese are also going "upmarket" in test and inspection. With Western customers

demanding lower failure rates, there's a greater emphasis on advanced technologies such as x-ray.
One final observation: China leads the world in noise. Either everyone here is deaf, or in coming years hearing aid makers are absolutely going to clean up.
A few of the new products at Nepcon China:
Skyray Instrument Intros EDX 3000D
EDX 3000D benchtop XRF spectrometer analyzes elements from sulfur to uranium and reportedly detects from 1 ppm to 99.99%. Measurement time is 60 to 200 sec. Detection limit can reach 1 ppm for RoHS substances. Includes a movable sample platform and automatic collimator for different-sized samples. $61,000.
Skyray Instrument Inc., skyray-instrument.com
Hirox Debuts Mini-SEM
Mini-SEM is capable of 15 nm inspection with 20,000-30,000X magnification. Generates images at between 2 and 10 frames/sec., depending on size. X,Y,R viewing is 20mm/20mm/360°. Sizes: 490 x 520 x 540 mm, or 400 x 160 x 340 mm. Runs on Windows XP. $40,000.
Hirox, hirox.com.cn
Tolo Touts MI-300 Wave Machine
MI-300 Pb-free wave soldering system has an 800 mm preheat tunnel, wave heigh of 0-12 mm, and forced-air cooling. Comes with standard foam fluxing (spray optional), runs at a conveyor speed of 300-9000 mm/min, handles PCBs of 50-300 mm. Uses PLC controls. $13,500.
Tolo Machinery Equipment Co. Ltd., sztolo.com
Rehm Rolls Out VxS Reflow Line
VisionX 934 nitrogen convection reflow oven come with nine preheat, three peak and four cooling zones. Throughput is a reported 180 boards per hr. Comes in sizes of 7 and 10 meters. Has two or three flux residue filter towers, and online profiling software.
Rehm Thermal Systems, rehm-group.com
VCTA Debuts A580 AOI
VCTA-A580 inline AOI uses a color digital CCD camera capable of 20 µm resolution. Has a 20 x 20 mm field of view, and handles boards from 50 x 50 mm to 400 x 430 mm. Requires <30 mm component clearance. X-y stage camera is said to have <10 µm accuracy.
Zhen Hua Xing Technology (Shenzhen) Co., vcta-aoi.com
SJ Inno Tech Debuts HP-620 Printer
HP-620 vision screen printer handles stencils of 736 x 736 or 800 x 800 mm and has a reported accuracy of +/-0.015 mm. Has an 8 sec. cycle time, 15 sec. for load-print-unload. Includes 2-D real-time top- and bottom-side SPI. Is said to print to 0.3 mm pitch, and 0.2 mm BGA. Handles boards up to 620 x 480 mm. Uses metal squeegees, with five speed print stroke. $75,000-$80,000.
SJ Inno Tech, sjinnotech.com

Antom Releases Solsys-8460IRTP Oven
Solsys-8460IRTP reflow oven operates via IR or hot air. Has eight heating zones (16 heaters). Uses a pin-chain conveyor that runs from 0.3-1.5 m/min. Has eight blowers and four cooling fans. Dimensions: 3650 x 1055 x 1410 cm in size.
Antom, antom.co.jo
Evest Shows EM Series Pick-and-Place
The EM multifunctional placement machine series is rated at 13,000 cph per IPC-9850 and

places components ranging from 0201 to 45 mm QFPs. Accuracy is a reported +/-0.06 mm at 3-Sigma. Has a three-stage conveyor, and includes up to 120 feeders, and can pick from tape, sticks or trays. SMEMA compatible.
Evest, evestcorp.com