

update

Counterfeit Chips on the Rise

As more firms report finding phony chips, the danger they pose becomes clearer

MAKING SEMICONDUCTORS is a big business—and, so it seems, is counterfeiting them. Just how big is becoming clearer than ever, thanks in part to the candor of the U.S. military, and it will become even clearer as new laws in the United States come into effect later this year.

In 2011, over 1300 counterfeit incidents were reported from around the world to Electronic Resellers Association International (ERAI), a private company that tracks counterfeit electronics for the industry. That's more than double the number reported in 2010 and 2008, and quadruple the number reported in 2009. ERAI's partner company, IHS, reported a slightly higher figure for 2011 by including data from the Government-Industry Data Exchange Program, a not-for-profit organization that, among other things, tracks counterfeits and component failures in the United States and Canada.

The fear is that these counterfeits—including used and relabeled commercial gear or components falsely labeled as military grade—will fail more quickly than the parts they're standing in for. And because semiconductors are

an integral part of everything from cellphones to nuclear reactor controls, the failure of a counterfeit chip in the wrong place could have deadly consequences.

"That's what we're all afraid of," says Jack Stradley, an expert on the U.S. government's semiconductor supply chain.

The new legislation, the National Defense Authorization Act for Fiscal Year 2012, aims to fight counterfeiting by requiring government contractors to track and report counterfeits and to be held accountable for replacement costs.

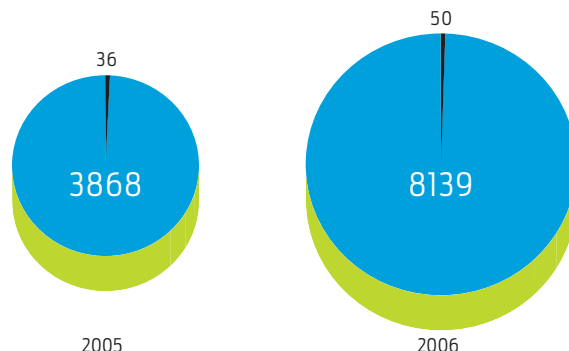
Until now, companies rarely reported fraudulent chips, says Lawrence Hurst, product fraud prevention manager at Intel. "We haven't been doing that," Hurst says. "In fact, most of the industry hasn't." In the past there was simply no financial reason to do so, he says. But with a new legal responsibility, Intel is now in the process of creating a database of counterfeit parts it encounters.

The U.S. law is in response to a 2010 U.S. Government Accountability Office report on counterfeits in the military and a 2011 congressional hearing on the dangers

A Bigger Problem Than It Seemed

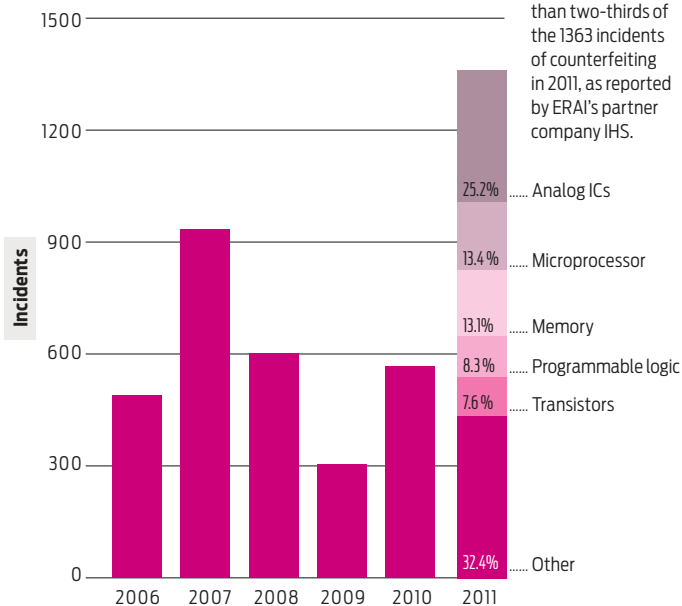
Companies don't usually report counterfeit chips to the U.S. government when they find them. A mandatory survey conducted by the U.S. Commerce Department in 2009 showed that less than 3 percent of incidents were reported in 2008.

■ NUMBER OF COUNTERFEITING INCIDENTS REPORTED TO U.S. GOVERNMENT
■ ALL U.S. COUNTERFEITING INCIDENTS UNCOVERED FOLLOWING SURVEY



Dubious Chips Double

Semiconductor businesses report some fakes to ERAI, a private group that tracks and fights counterfeits.



Five types of semiconductors accounted for more than two-thirds of the 1363 incidents of counterfeiting in 2011, as reported by ERAI's partner company IHS.

of counterfeit electronics. A report introduced in the hearing, based on a mandatory survey of producers, dealers, and military contractors, estimates that 9356 fake parts were found in 2008 alone.

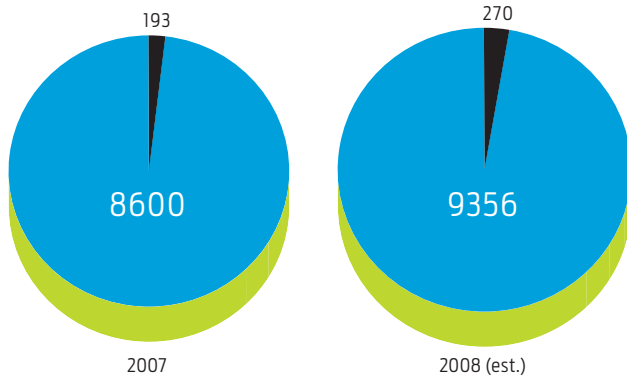
Those same counterfeits are sold internationally. Both the Japanese Ministry of Defense and the U.S. Navy bought electromagnetic interference filters from Raytheon, later found to contain counterfeit versions

of Fairchild semiconductors. The United Kingdom subsidiary of military contractor General Dynamics also bought counterfeit semiconductors, though it discovered the fraud before including the components in its products, according to the 2010–2011 annual report by the U.K.'s IP Crime Group.

The few prosecuted cases of counterfeit goods distribution show that it's easy to sneak products into the

The survey revealed that counterfeit chips were found in the U.S. Navy's **Seahawk helicopters**, Boeing **Poseidon jets**, and U.S. Air Force **C-27J transport planes**.

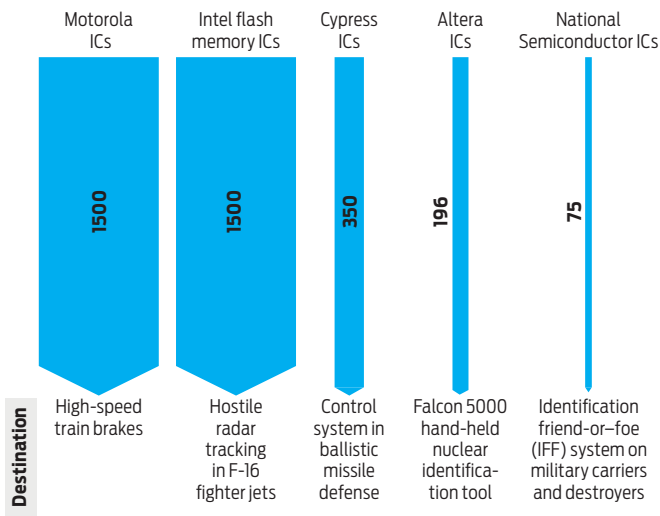
Source: *Defense Industrial Base Assessment: Counterfeit Electronics*, January 2010, U.S. Department of Commerce



A Case Study in Fake Chips

In 2010 the United States prosecuted its first case against a counterfeit-chip broker. The company, VisionTech, sold thousands of fake chips, many of which were destined for military products.

Counterfeit parts sold by VisionTech



Source: Sentencing memo, *United States of America v. Stephanie A. McCloskey*, filed 7 September 2011

increasingly complicated supply chain. Between its point of manufacture and its use in an action-ready missile, a semiconductor is often bought and resold many times. Overworked purchasers rely on brokers, who in turn buy from relatively anonymous online forums. In theory, chips are tested at multiple points in the supply chain, but shady companies have lied about tests, authenticity, and origins. The majority of coun-

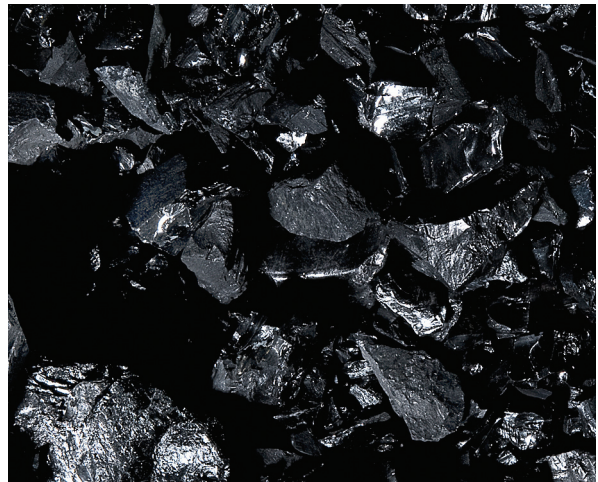
terfeit chips can be traced to China, but the primary fault lies in the industry's purchasing practices, Stradley says.

Stradley believes that the new law won't do enough to force reform of the semiconductor supply chain. It may take a fatal disaster to do that. "It's always that way," says Stradley. "That's part of the problem—we haven't had any serious accidents we can point to."

—CELIA GORMAN

Cleaner Coal's Last Stand

China's first coal-gasification power plant starts operating amid high hopes, delays, and cost overruns



FOR MORE than three decades, gasification technology has promised a smarter conversion of coal to electricity. By using heat and pressure to turn coal's motley mix of molecules into a consistent stream of simple gases, gasification plants squeeze more power from a ton of coal and control the resulting by-products better. In April, engineers in Tianjin, China, fired up a gasification power plant that will provide a "critically important" test of the technology's commercial potential as a low-carbon power source, according to Julio Friedmann, who leads the carbon management program at Lawrence Livermore National Laboratory, in California.

At 250 megawatts, the facility, known as GreenGen, is the world's largest integrated gasification combined cycle (IGCC) generator. It's also the first built explicitly as a test bed for capturing carbon. This combination of carbon capture and commercial scale is needed to evaluate coal gasification's potential contribution to stopping and reversing human-accelerated climate change. "We still have no plan as nations or as a world to make really deep greenhouse-gas emissions cuts. We have not economically vetted most of our important options, including IGCC plants such as GreenGen," says Friedmann.

GreenGen more closely resembles a refinery than a generating station. IGCC plants turn coal into a blend of gases before burning those gases to drive both gas