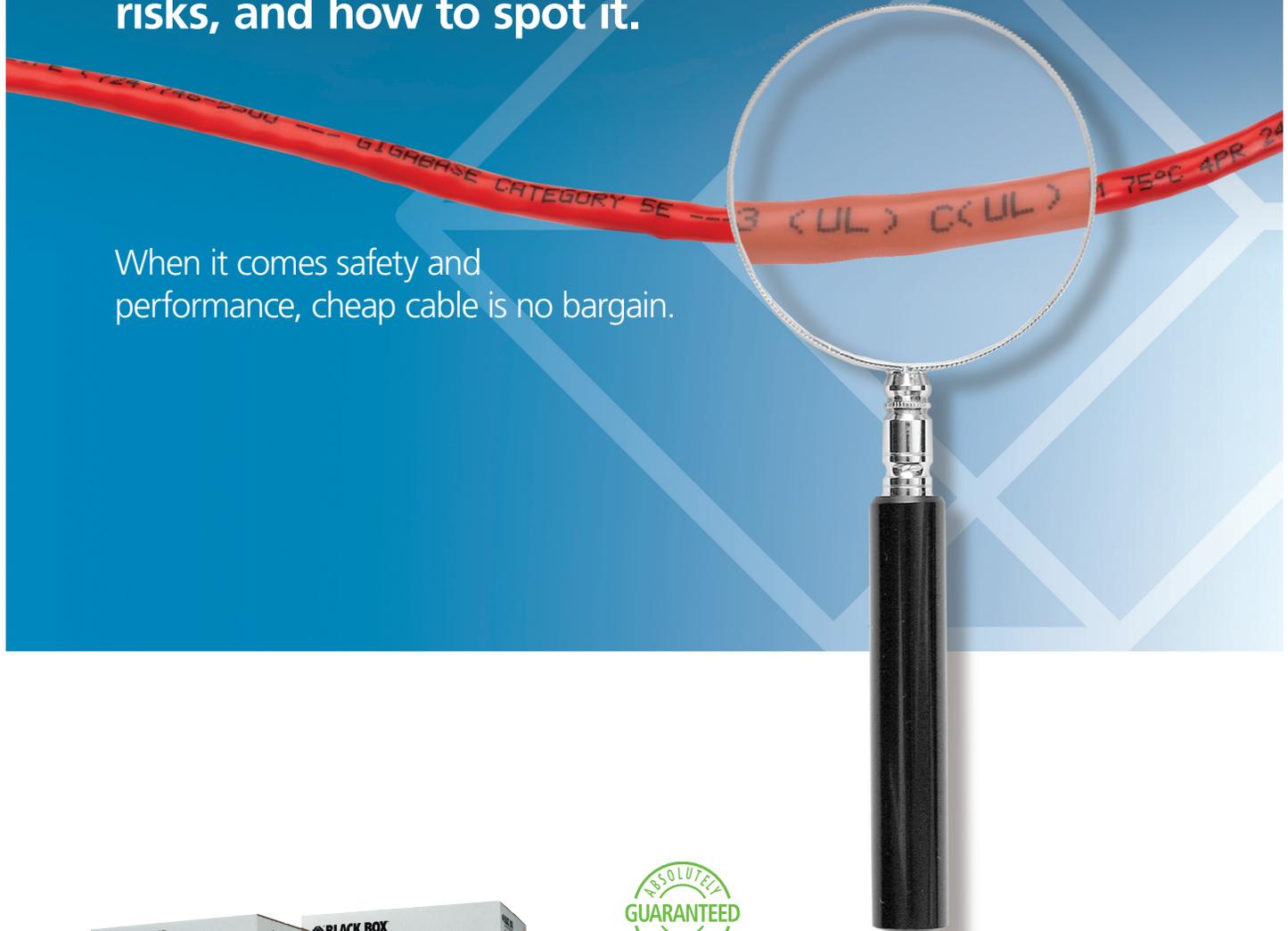




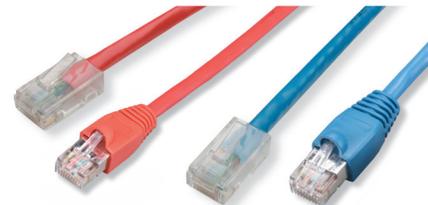
Buyer beware: If the price seems too good to be true, it is.

Counterfeit cable: The dangers, risks, and how to spot it.

When it comes safety and performance, cheap cable is no bargain.



GigaTrue® CAT6 Bulk Cable
GigaBase® CAT5e Bulk Cable



GigaTrue® CAT6 Patch Cable
GigaBase® CAT5e Patch Cable

blackbox.com/go/CounterfeitCable

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We're here to help! If you have any questions about your application, our products, or this white paper, contact Black Box Tech Support at **724-746-5500** or go to **blackbox.com** and click on "Talk to Black Box." You'll be live with one of our technical experts in less than 30 seconds.

Buyer beware—in terms of safety and performance, cheap cable is no bargain.

If you're worried about counterfeit cable, you have good reason to be. It's one of the hottest topics in the cabling industry today as the prevalence of non-compliant cable continues to grow. It's estimated that as much as 20% of the cable for sale now is unsafe, unapproved, or counterfeit. When you see CATx and fiber cable priced significantly lower than Black Box® cable (or other name brands), put up a red flag. The cable is probably counterfeit, substandard, non-compliant, and very cheaply made, even if it sports a brand name, UL® number, or ETL logo. Counterfeit cable is primarily imported cable that is marked and advertised as being compliant to North American fire codes, TIA specifications, and UL safety standards but isn't. The cable and packaging will most likely carry false UL and ETL marks.

The subject of counterfeit and non-compliant cable is extremely serious because of public safety and liability issues. Installing non-compliant cable is a very expensive risk, which can result in civil liabilities, monetary damages stemming from negligence and fraud, and criminal violations of local and state building codes and regulations.

Policing the industry.

Agencies and associations, including UL, ETL, and the CCCA (Communications Cable & Connectivity Association), as well as the legitimate cable manufacturing community, are not idly standing by while dangerous cable floods the market. Founded in 2007, the CCCA is a non-profit association committed to ensuring all cabling products in North America comply with existing codes and standards. The association is growing, and members include many of the industry's top cabling manufacturers.

Agency representatives and code officials are aware of the risks non-compliant cable poses and are taking action to stop the flood of cable in the market through testing and education. If you're planning to purchase cable, you need to know how to protect your team, organization, and building—literally. When it comes to cable, you really do get what you pay for.

Don't play with fire—flame and smoke tests.

Counterfeit and substandard cable pose significant fire safety concerns. Cable counterfeiters are known for passing off riser cable as plenum cable, which routinely fails flame- and fire-resistance tests because it has little or no heat protection. Non-compliant cables are made from lower fire-performance materials and are highly combustible, particularly in building plenum spaces and in vertical floor-to-floor riser shafts.

In its studies, the CCCA tested cable against fire-safety standards. Seven out of nine CMR cables failed UL 1666 fire-safety tests, some with serious failures. In one instance a cable that failed the flame spread test burned the entire length of the chamber in an incredibly fast 45 seconds. The NFPA (National Fire Protection Association) 262 limit is 5 feet. The normal expected value is 4 feet. Black Box cable is typically in the range of no burning to 1–1.5 feet.

The CMP tests results were far more alarming. All the plenum cables failed the Peak Smoke test as well as the Average Smoke test. The failures were usually in the range of twice the allowable limit. The NFPA 262 limit for the Peak Smoke test is 0.5 Absorbance, which means 32% of the light is blocked out by smoke. The normal expected value is 0.25. Black Box cable routinely tests at 0.1. The average of the failing samples was just over 1.5. A score of 1 means that 90% of the light is blocked out by smoke. A 2, the highest measurement, means 99% of the light is blocked out. So a failing 1.5 score means that approximately 95% of the light is blocked by thick, heavy smoke.

Rapidly spreading fire and heavy smoke makes it extremely difficult to evacuate and rescue occupants of a building. Counterfeit cable puts lives on the line. Remember the MGM fire in Las Vegas in the early 1980s? Combustible materials, including cables, burned with such speed and intensity that 84 people lost their lives. What if counterfeit cable causes a fire or accident where people are hurt or killed? Is that a chance you're willing to take?

Don't pass go—network performance.

You can't count on decent network performance from counterfeit and low-grade cable. Counterfeiters are notorious for using copper-clad aluminum conductors instead of annealed copper. These conductors are very brittle and subject to breakage. They are also in violation of TIA 568C.2 and UL® 444. In addition, very often the twists aren't done to spec either. Because of this, you may get very poor or erratic network performance, even over short distances. Read on to learn how to identify copper-clad aluminum conductors.

Bulk cable. The CCCA commissioned an independent third-party agency to conduct two rounds of studies on bulk cables done a year apart. A total of 17 samples was tested from 12 different manufacturers. The CCCA found that many samples did not comply with TIA 568 and UL 444 physical construction requirements. The tests also resulted in a high failure rate against TIA performance standards.

Patch cable. Patch cables are the most overlooked component of the Channel Link, but they are just as important as bulk cable. Remember the saying, "A chain is only as strong as its weakest link"? If a patch cable is non-compliant, it can ruin expensive electronics, invalidate warranties, cause poor network performance, and lead to a loss in productivity. Patch cables are usually not supplied by the structured cabling installer but by someone in the IT department, who frequently buys them on-line based on price. Just because a cable is advertised as CAT6, doesn't mean it's compliant.

The CCCA did large-scale performance testing of Category 6 copper patch cords. Test results showed an 85% failure rate in cables produced offshore by companies who are largely unknown in North America. 78% of the failing samples failed NEXT tests by a margin of 3 dB or more. A second sample set of Category 6 copper patch cords produced by multiple, well-recognized manufacturers was also tested and showed a 0% failure rate.

Other patch cord issues include non-compliant plugs that don't meet requirements. Problems can include substandard gold plating on the contacts, plating that erodes and corrodes, and contact spacing and dimensional issues that can cause intermittent connections and link loss.

What's at risk—liability issues.

There's a lot at risk if you install non-compliant cable, either knowingly or unknowingly. Installing non-compliant cable can result in violations of state and local building codes and fire regulations. If a contractor installs non-compliant cable and it causes damage, such as a fire, the contractor can face civil liabilities and monetary damages stemming from negligence, fraud, and breach of contract and warranty. In addition, contractors can face criminal liabilities stemming from building code violations. Enforcement can include halting the installation and removing and replacing the cable, which can be extremely costly. Other criminal liabilities can include fines and imprisonment. The costs of using counterfeit or non-compliant cable can be very high indeed.

The CCCA commissioned a white paper from the law firm of Crowell Moring to look at potential liability for contractors who install communications cables that do not comply with NEC (National Electrical Code) requirements. The paper can be accessed at the CCCA web site www.cccassoc.org.

In the white paper, Crowell Moring studied the laws in Connecticut, Virginia, and Florida. Because each state incorporates NEC into its building codes, a violation of those codes is a state violation. Crowell Moring explains, "Any installed cable that fails to meet the NEC standards, whether known, apparent, or not, opens a contractor up to penalties for those failures."

The paper concludes that contractors who install CMR or CMP cable may face liability based on violations of building codes. If a contractor installs non-compliant cable that causes damage, such as a fire, the contractor can also be held liable in civil lawsuits and face fines, imprisonment, and replacement costs.

The paper states that "A contractor need not have actual knowledge that the cable is non-compliant to be found negligent. If a contractor knew it installed non-compliant cable, but said it was compliant, the contractor can be charged with fraud. And lastly, if a contractor installs non-compliant cable, either knowingly or unknowingly, the contractor is liable for breach of contract and warranty claims.

How to spot counterfeit and non-compliant cable:

1. Price. If a price seems very low, the cable is probably counterfeit. If you see 1000 feet of bulk cable priced significantly lower (\$30-\$50 for PVC and up to \$100 for plenum) than what you would expect, beware. The chart below illustrates some cable prices recently found on the Web.*

	Bulk Cable Prices*/1000 ft.	
	CAT5e	CAT6
Suspect PVC Cable	\$76.00	\$105.00
Black Box PVC Cable	\$104.95	\$149.95
Suspect Plenum Cable	\$180.00	\$284.95
Black Box Plenum Cable	\$229.95	\$379.95

	Bulk Cable Prices*/3 ft.	
	CAT5e	CAT6
Suspect PVC Cable	\$0.85	\$1.10
Black Box PVC Cable	\$5.95	\$8.95

* Prices as of February 2013

* Prices as of February 2013

2. UL® number. None, fake, or illegitimate. If there is no UL number, that's an instant tip-off. Even if it is a real UL number, it's possible that it was copied from a "good" cable and printed on counterfeit cable. UL requires the UL mark on the product. Inspect the cable and packaging to see if there is a UL mark and "E" number. If one or both are missing, be suspicious. If there are UL numbers, go to the UL Online Certification Directory to verify the number and the manufacturer's authorization. If you can't find the "E" in the directory, report the cable to UL. UL also posts alerts on unauthorized numbers on-line.



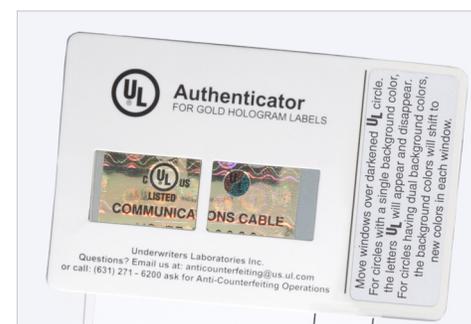
UL Listed mark.

UL marks. Cable should have the following marks: UL 444–Standard for Safety for Communications Cables; UL 910–Standard for Safety for Test for Flame-Propagation and Smoke-Density Values for Electrical and Optical Fibers Used in Spaces Transporting Environmental Air; and UL 1666–Standard for Safety for Test for Flame Propagation Height of Electrical and Optical Cables Installed Vertically in Shafts.

At this point, it should be noted that there are two different types of UL marks. The UL Listing is the safety listing indicating that the product has been tested and evaluated and has met the UL Standards of Safety. The second set of evaluations is the UL Performance Verification. In these evaluations, products are tested against industry performance standards. The mark is like the traditional UL in a circle, but there is also the word Verified underneath the mark.

UL hologram. UL introduced gold hologram labels in 2009 to help U.S. customs officers and other law enforcement agencies, as well as distributors, retailers, and consumers, identify legitimate cable. UL requires the holographic label to be affixed on the attached tag, reel, or the smallest unit container in which the product is packaged at the original manufacturer. The labels are purchased from and tracked by UL.

The holograms have color-shifting ink, a repeating pattern of floating UL symbols, a distinctive burst pattern around one of the UL symbols, and wavy lines. On its Web site, UL offers a Hologram Authenticator, a special credit card-sized device that can be used to identify legitimate UL holograms. The card has a special window on it. When moved across the UL logo made with color-shifting ink, the logo should appear and disappear. To get the Authenticator Card, go to ul.com/marks.



The following cable types are subject to the holographic-label requirement:

- Communications cable
- Communications cable verified to UL Performance Category Program
- Data transmission cable verified in accordance with national or international specifications
- Community antenna television cables
- Data processing cable
- Non-power-limited fire-alarm cable
- Instrumentation tray cable
- Network-powered broadband communications cable
- Optical fiber cable
- Power-limited circuit cable

NOTE: Both UL and ETL test against safety standards and performance standards. A "Listed" mark indicates safety performance testing. A "Verified" mark indicates performance verification. UL is more known for its safety mark and ETL for its verification mark.

3. ETL logos. Counterfeiters use them whether they are earned or not. If you see an ETL mark, see if the manufacturer's number and control number are also listed. That information is required on the ETL Web site so you can verify it. If there is no name on the jacket, you need to contact ETL to verify the mark's validity. You can check ETL Listed and Verified products at Intertek.com/directories. You can also simply ask the seller for the ETL test results.



ETL Verified mark.

Like UL, ETL evaluates products for safety and performance against industry standards. A product bearing the ETL Listed Mark is determined to have met the minimum requirements of prescribed product safety standards. The ETL Verified Mark is a symbol of performance integrity.

4. Printing/legend. Is the printing poorly done on the box and the cable? Are there any typographical or grammatical errors? Check the UL logo. It should have the letters UL arranged diagonally (descending left to right) within a circle with a small ® symbol directly below the U. Does the cable legend have the proper markings?

5. Color. Does the color match previously bought cable?

6. Jacket/construction. Does the cable look like previously purchased cable? Are the conductors straight or oddly "twisty"? Does the jacket feel like a riser or plenum cable? A riser cable feels more flexible than a stiffer plenum cable. In addition, the insulation of the wire colors is more brilliant in riser cables and is more translucent in plenum cables.

7. Patch cable considerations. Oddly enough, you should smell the cable. Some non-compliant cables have a plasticizer issue with the jacketing, which can produce a bad odor. See if the cable feels oily or too stiff. Both are indicators of counterfeit cable. Check the modular plug. It should be intact and not cracked. It should also be made of a fire-resistant plastic. To test this, put a lighter to the clip. If it catches fire and does not self-extinguish, it is substandard. The gold contacts should not be too shiny. Often substandard contacts appear shinier than true gold contacts. Check the boot to make sure it is not pinching or crushing the cable.



Copper-clad aluminum conductors provide poor network performance and are in violation of TIA 568C.2 and UL® 444. Photo courtesy of The Fiber Optic Association.

8. Conductors. Counterfeiters are notorious for using copper-clad aluminum conductors instead of annealed copper conductors. These conductors are very brittle and subject to breakage. They are also in violation of TIA 568C.2 and UL® 444. Copper-clad aluminum provides very poor conductance and inferior network performance. To check, strip the cable and inspect the conductors.

	Cable Weight (1000 ft.)	
	CAT5e	CAT6
Compliant Cable	21 lb.	27 lb.
Black Box Cable	23 lb.	30 lb.
Non-Compliant Cable	14 lb.	20 lb.

9. Weight. If the cable box/spool feels light, compare its weight to cable you know performs up to standard. Counterfeit and substandard cables often have undersized copper conductors or copper-clad aluminum conductors that weigh half as much as genuine cable. They also often do not come on spools. When looking at cable, especially on-line, look for the weight. If it's not listed, ask.

10. Free Cable Check App. The CCCA has produced a free Cable Check™ App that you can use as a field-screening tool and checklist to help identify and avoid non-compliant and counterfeit cable. The app is available at their Web site: cccassoc.org.

Useful links.

blackbox.com/go/CounterfeitCable
White paper
Video
Flyer

UL.com
Verified Cabling Products
UL Numbers
Alerts
Certifications Directory

ETL: Intertek.com
ETL Listed and Verified products

CCCA: cccassoc.org
Tests
Notifications
Cable Check App

Black Box cable—genuine, guaranteed, independently tested.

When you buy Black Box cable, you buy peace of mind. All Black Box copper cable and our indoor bulk fiber cable are guaranteed for life. To further ensure you get the real deal, Black Box puts its cable through independent testing. Once a quarter, an Intertek inspector visits Black Box and randomly selects cable and cabling products. This includes all the following: Our GigaBase® CAT5e and GigaTrue® CAT6 Solid Bulk Cable is ETL Verified at the component level. Our CAT5e and CAT6 Channel Solutions (bulk cable, patch cable, jacks, patch panels, wiring block) are also ETL Verified in a LAN environment. In addition, we put our CAT5e and CAT6 plenum and riser cable through independent burn/smoke tests. Black Box cable is the real deal.

About Black Box:

Founded in 1976, Black Box is a leading technology solutions provider that helps customers build, manage, optimize, and secure their networks. Black Box is ISO 9001:2008 certified and has received numerous industry recognitions. Black Box provides its customers with free, 24/7 pre- and post-sales technical support.

Black Box is a leading provider of copper and fiber cabling infrastructure products, serving 175,000 clients in 150 countries with 200 offices throughout the world. The *Black Box® Catalog* and Web site offer an extensive range of products including CAT7, CAT6A, CAT6, and CAT5e cable; fiber optics; connecting hardware; cable management solutions; power protection; and testers and tools.

Find what you need to build and expand your structured cabling system at blackbox.com. From our most popular cables to industrial cabinets and everything in between, Black Box has all the components of a communications infrastructure.

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