



Scrap Heap

By recycling scrap metals from UTP copper cable, you can reincarnate end-of-life products, help the environment, and maybe even make some money!

BY D.A. "Bo" CONRAD, RCDD

While there are obvious reasons to recycle, from a business standpoint most companies use recycled products or promote the use of green materials only if doing so saves *or* makes money. Scrap metal recycling actually does both.

With today's high cost of copper, it's no wonder recycling cable is on the rise.

According to the Institute of Scrap Recycling Industries (www.isri.org), the scrap recycling market in the U.S. is a \$65 billion industry. More than 150 million tons of scrap metals are recycled in the U.S. each year. Copper represents 1.5 million tons, and aluminum weighs in at 4.5 million tons.

While these two non-ferrous materials are predominant in information transport systems (and telecommunications), they only represent 4% of the total recycled scrap (vs. the "ferrous" stuff—iron and steel—at 81.4 million tons, or 56%).

Recycling cable finally became popular when the price of scrap copper went above \$0.30/lb. Prior to this rise, recycling did not justify the labor involved to remove abandoned cable.

With prices where they are, contractors are keeping their recycling bins locked to deter theft—which has become a common occurrence anywhere spare copper can be found.

Treasure

The Ceiling's The Limit

It wasn't long ago that most cable was abandoned and left in the ceilings. That would still be the case if it weren't for three factors:

- **enforcement of the National Electrical Code (NEC) provisions;**
- **added incentives provided by the U.S. Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED) program; and**
- **the exploding price of copper.**

Removal of "abandoned" low-voltage/telecommunications cable from building pathways is required by the NEC (2002, 2005, and 2008) when the cable is not terminated (at one of both ends) or tagged for future use. While the code doesn't require recycling specifically, the fact that the cable must be removed does help inspire us to do something productive with it (rather than just send it to a landfill).

USGBC's LEED program—in its *Green Building Rating System*—offers manufacturers, contractors, and end-users the opportunity to acquire points. While the LEED program is concerned primarily with the permanent environmental aspect and construction of a building—and less concerned with disposal—local or state government agencies can give credit for diversion of waste from landfills (sheet-rock/wallboard, etc.).

Subsequently, the primary focus is on recyclable materials being removed from a building. The only practical, uncontaminated materials that can be extracted from a building are its telecommunications, electrical cabling, and plumbing metal scrap.





Recyclers Revealed

Residential recycling consists mostly of plastic bottles, aluminum cans, and newspapers/ cardboard. The sole purpose of redemption (“social-political”) recycling fees for these items is to reduce land-fill usage and litter.

From a commercial recycler’s perspective, there is no real financial stimulus to recycle plastic—unless it is subsidized by governmental incentives or niche resellers/recyclers of plastic. This is why business-to-business metals make up the vast majority of scrap recycling.

These metals are typically handled by Material Recycling Facilities (MRFs), which require high-economies of scale both in investment and maintenance. ⚡

To some, the appearance of a MRF facility may look a bit bedraggled, but don’t be deceived; the process has to be a finely-tuned, continuous operation to turn mixed material scrap into “furnace ready” scrap metals, which is a lower-cost alternative to raw material resources.



Copper Reincarnation

There are three methods to separate copper from its polymer jacket:

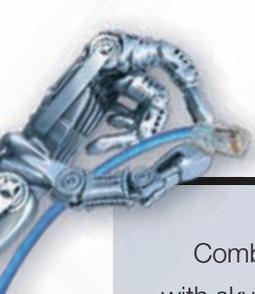
Stripping: Common but very labor intensive and only affordable in “select” regions of the country and overseas. It is also not practical for the smaller-diameter UTP cables (especially those with inside pair separators).

Melting: In most of the U.S., incineration has been phased out/outlawed. However, Mexico is another story; burning is also common method on ships in international waters. A majority of UTP cable gets shipped to China—where weak environmental laws permit burning.



Grinding-chopping-granulating: This cleaner method is now most common in the U.S. The process breaks up the cables and uses a density separation technique to sort the copper from the polymers. Some insiders call it “above ground mining” or “panning for copper!” ⚡

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Combine NEC requirements and LEED incentives with skyrocketing copper prices, and it's easy to see why cable recycling will continue to grow.

Further, copper is part of a burgeoning trend. Recycled materials are the second largest U.S. export to China, trailing only behind electronics. The U.S. exports roughly 800 million metric tons of copper and 1,481 metric tons of aluminum each year.

One can expect these numbers to grow. Copper demand is expected to grow at an annual rate of 18-20% for the next three years due to continued growth in VoIP, wireless APs, and data centers.

Making Cents + Sense

To understand the value of recycled metals, let's first look at metal prices. According to the Commercial Exchange in New York (www.COMEX.org) and its counterpart in Europe, London Metal Exchange (www.LME.com)—and www.metalprices.com—back in 2001, copper prices were roughly at 45 to 66 cents per pound . . . with scrap Cat 3-5 at about 20 cents.

Between 2003 and 2006, copper commodity prices jumped 300% from \$1.50 to as much as \$3.90/lb. The red metal dipped as low as \$2.50 at the beginning of 2007 as China temporarily reduced

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its high demand on the open market (combined with preparing for the Olympics).

However, since then it has climbed again. Copper's price has been at or near the \$4.00/pound mark for much of the first half of 2008. What does that mean for recycled materials?

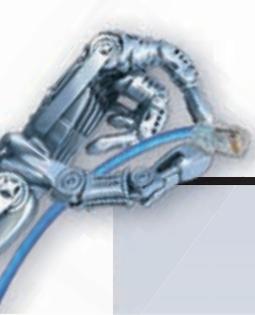
At the time of this writing, with variances depending on weight and geography, U.S. recyclers are paying out something like this:

- \$0.60 - \$0.85/lb for (jacketed) telecom UTP (at a high of \$2.00/lb)
- \$2.10 - \$2.20/lb for Class 1—no preparation and ready for shipping
- \$2.20 - \$2.40/lb for Class 2—no preparation and ready for shipping

Keep in mind that UTP copper cables are between 46% and 58% copper. In contrast, 26-28 AWG electronic cable is only 37% copper, and power cables are up to 92%. Prices vary accordingly. ⚡

Conrad is owner of Crossbow Communications (www.crossbowcom.com). The author would like to offer thanks to Greg Fry of Nott Recycling and Bill Stratton of Stratton Metals, LLC for research and facility tours in Richmond, Va.





Step 1: Weighing in

A truck containing a load of recycled copper cables is weighed in. After it is unloaded, it is weighed again to determine the material's weight. Payment is made to driver, usually in cash.



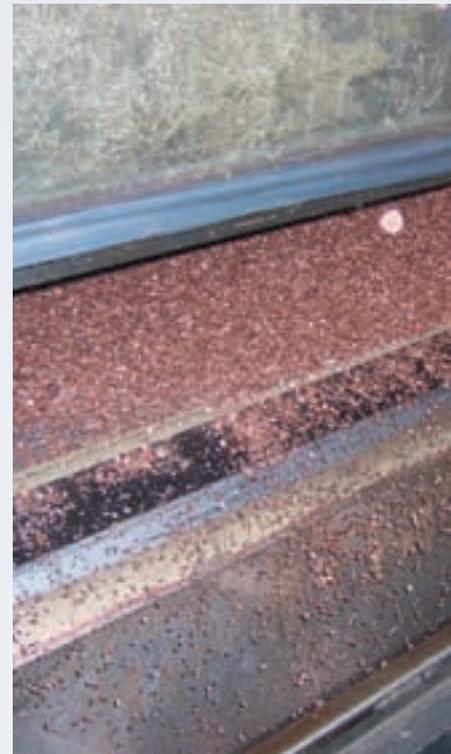
Driver's licenses are documented with each load in an effort to stem the pawing of stolen copper cables.

Cables are then separated from other copper products in the effort to produce Number 1 copper. When separated from the polymers, it is 99%-plus pure copper (or what's referred to as "furnace ready").

Alternatively, Number 2 wire is a minimum of 92% copper and is usually a mix of copper products including tinned copper cabling and plumber tubing. These batches will have to go through another primary and secondary mill to become Number 1 and, therefore, are paid out at bit less per pound.

Step 2: Pre-chopping

A crane loads the cables into a chopping hopper. Inside the cables are chopped into bite size pieces that can fit into a granulator. The conveyor belt is on a predetermined angle to separate the copper cable from other metals so not to contaminate the batch.



Step 4: Dry Air Gravity Table

This is a conventional process used in the mining industry. Granulated copper and polymers are separated by air being forced through a perforated, high-frequency vibrating conveyer belt.

This perforated vibrating belt air “table” is slightly angled, with three funnels at the end to catch the granulations. The air forces the lighter polymers to gravitate to the lower end while heavier material or the copper stays on the high end. The “hybrid” granulations in the middle have not been separated and are resent through the process again. Rejects are hand-separated.



Step 3: Granulation

The chopped bite-size pieces are again chopped—into much smaller, granulated pieces. Large motors and cooling fans are required to operate the dry air gravity separation process.



Step 5: Shipping

After the pure Number 1 copper bin is filled, a forklift takes it to the scale for weight measurement—the product shown in the picture is about 4,000 lbs. (x \$3.56/lb = \$14,240 vs. 4000 lbs of scrap UTP @ \$0.70 = \$2,800).

Byproduct polymer waste is taken away and placed into holding areas. These small granulations quickly become a mountain of plastic mulch.