

## How To Differ Between Pure Nickel Strip Battery Tabs Vs. Steel Nickel Tabs



Building your own electric bicycle battery isn't rocket science, but it isn't the simplest job either. When putting together an ebike battery pack, you want to make sure you're using pure nickel strips and not nickel coated steel strips.

Conductive metal strips are spot welded between all the cells of an electric bicycle battery pack. Nickel is the material of choice due to its low relative resistance and ease of spot welding. Steel is cheaper than nickel, which is why many vendors sell nickel coated steel strips. It brings the cost down, but at the expense of pack health. Because steel has higher resistance, the same size strips will heat up more, wasting energy from your pack. This not only cuts down on your range but also damages your battery by cooking it slowly over time with extra heat.

Most vendors are honest and clearly indicate whether they are selling pure nickel (usually 99.95% pure or higher) or nickel coated steel strips. However, I've seen people get scammed by paying for pure nickel strips and receiving the steel ones instead.

The problem is that it can be nearly impossible to distinguish between pure nickel strips and nickel coated steel strips using only the naked eye. They look identical from the outside. They are both attracted by a magnet. The density of steel and nickel is so close that weighing them is also difficult. A sample long enough to have enough mass to make a measurable difference will also likely have enough small variations in size to destroy any chance of a fair comparison.

But don't fret! I've devised two different methods for testing nickel strips to determine if they are pure nickel or nickel coated steel.

### Method 1

The first option for testing the strips is with a Dremel or other rotary tool and a sanding or grinding attachment. Simply grind or sand at the nickel strip using a high speed setting. If you see sparks after a second or so, you know you've got a steel strip. Steel will spark when struck at sufficient speed with a sanding or grinding attachment. The wheel quickly goes through the thin nickel coating and reveals the steel below the surface.



If you sand or grind away for more than a second or two and still see no sparks, you know you've got pure nickel.

### Method 2

The next option is better if you don't have a Dremel or other rotary tool. Simply scuff up the steel strip with sandpaper or any other rough object (a wire brush, a screwdriver, even a house key) and place it in a cup of saltwater. Make sure you've scratched up the surface to expose any steel below, if there

is any. You'll know there's steel present in a day or so if you see rust forming. Steel rusts easily, but nickel is highly corrosion resistant. If there's no rust after a day or so, you've got a pure nickel strip!



Fun fact: I actually discovered Method 1 while preparing to test out my idea for Method 2. I used a rotary tool with a sanding wheel to scuff up some sample strips so I could put them in saltwater. That's when I realized that some of the strips were throwing sparks. By completing the saltwater test, I confirmed my suspicion that it was the steel core strips that were shooting sparks while the pure nickel strips didn't spark at all.

So now you know how to confirm that you've got pure nickel strips. Stay tuned for my upcoming article on how to use those nickel strips to build an ebike battery.