

Why Use Tri-Metal Albaloy Connectors

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In recent years there's been an emergence of a newer type of metal plating used on electronic connectors called Tri-Metal Albaloy. Tri-metal albaloy has some remarkable characteristics that make it an ideal choice for RF cables specifically, but to better understand tri-metal albaloy it helps to compare it to and understand the other types of metal plating that have also been used on connectors in recent years.



Silver

In the past Silver has been used for connectors but it's probably obvious that the immediate drawback to using silver is the cost. Silver looks good and is malleable but still tough, which makes it ideal for things like jewelry and, (as the name makes clear), silverware.

Beyond being pricey, however, silver also doesn't stand up to corrosion as well as some other metals. If you think of the Olympics this is actually what separates silver from the gold, (from a purely metallic standpoint). Gold will withstand corrosion, but silver will eventually give way to it. From an electronic standpoint silver avoids issues with intermodulation as well. Intermodulation is a very complicated topic but in short intermodulation is when you have interfering, (or inter-modulating), electronic signals that create lots of problems in RF applications. There are lots of reasons for intermodulation and connectors are one of the most common. Silver connectors, when in good condition and connected correctly shouldn't be a cause for passive intermodulation, (or PIM), largely because they are not magnetic.

Rusty connections, however, are one of the most common causes of PIM and silver over time, because it is susceptible to corrosion, can become a source of PIM issues.

Nickel

Nickel connectors solve a number of the issues that exist with Silver connectors. Nickel is far less expensive and is great at withstanding corrosion.

There are a few issues with nickel however, the first being that many countries have actually placed heavy restrictions on nickel since it is a well known allergen. The EU in particular placed heavy regulations on nickel being used in products that come in contact with skin, (jewelry, car interiors, etc.). This has lead to nickel being used less on a number of products, including RF connectors.

The second issue is that nickel can run into intermodulation issues, largely because nickel is magnetic. Nickel is still commonly used on things like audio equipment where the connections are smaller and less nickel is in use but on larger RF cables which inherently have larger connections it can become problematic, and quickly.

Lastly, nickel is not easy to solder and that becomes a big problem when being used in electronic applications.

Tri-Metal Albaloy

Tri-Metal albaloy, (as the name implies), is a metal plating made up of 3 different metals: copper, tin, and zinc, (approximately 55% copper, 30% tin, and 15% zinc). Tri-metal albaloy is sometimes also referred to as “white bronze” because of its color. It has a smooth texture yet is incredibly strong and will hold up to normal wear and tear.



Tri-metal albaloy gives you the best of both the silver and nickel worlds. It is extremely resistant to corrosion and tarnishing while being far less expensive than silver. Additionally, like silver, tri-metal albaloy is non-magnetic and as a result avoids a number of intermodulation issues right off the bat. And because tri-metal albaloy is much more resistant to corrosion it shouldn't become a source of PIM down the road either. Tri-Metal albaloy is also far easier to solder than nickel and of course, because it does not contain any nickel, (or lead for that matter), it means there are no allergen or regulation issues.

Tri-Metal albaloy has grown in popularity since the EU's regulations on nickel but for all the reasons listed above, it should grow in popularity regardless.

Is there a downside to Tri-Metal Albaloy? Not really. The only thing that could possibly be said is that it isn't as corrosion resistant as nickel, but very few things on the planet compare to nickel in terms of corrosion resistance. Despite this amazing attribute nickel still has its own set of flaws and tri-metal albaloy solves all of those while still being *extremely* corrosion resistant. Tri-Metal Albaloy isn't corrosion proof but it comes pretty darn close.

Conclusion

If you're using RF cables the obvious choice for connectors at this point should be Tri-Metal Albaloy connectors. Nickel and Silver both have issues that are resolved by tri-metal albaloy and there's little question that tri-metal albaloy connectors should be your choice if you want to have as few problems as possible.

All of Gamma Electronics, all our cables are assembled with tri-metal albaloy connectors.

Gamma cables [can be viewed here.](#)