

Coil Alloys and Your Health

Are the metals used in atomizer coils safe to use for extended periods – decades or scores of years?

If you're super careful titanium might be the safest wire commonly used for vape coils today. [At the bottom of this article are some suggestions which are safe but not commonly used in atomizer coils.] And "super careful" means never running the titanium coils in anything other than Temperature Control (TC) mode. If you glow it you run the risk of 1) catching it on fire a bit like magnesium, and 2) producing a white powdery or chalky looking substance called Titanium Dioxide or TiO₂ which some studies claim is bad for you while other studies claim is relatively safe for humans:

- <https://academic.oup.com/annweh/article/49/6/461/176940> and opposed:
- <http://nj.gov/health/eoh/rtkweb/documents/fs/1861.pdf>

The fact of the matter is that we just don't know a whole lot about titanium yet. It's relatively new to manufacturing and fabricates even though it may seem otherwise: being used in so many products from gadget housings, to supports (camera tripods, towel racks, etc.), pigments in cosmetics, and even food colorings. Unlike nickel, iron, aluminum, chromium, manganese, molybdenum and of course silver, gold and platinum, not very many studies have been done with titanium and none that were broad enough to be conclusive about very much at all concerning human health.

Kanthal is 25% chromium (+/- 5%) and 6% aluminum (+/- 1.5%) with the rest being iron. Iron won't hurt ya (much) but both chromium and aluminum are really terrible substances to be putting into your system. The quantities we're dealing with wouldn't bother me if we were talking about skin osmosis or even intestinal absorption - both slow and highly inefficient. But we're talking about the lung with puts nearly all the stuff directly in the bloodstream very rapidly - very close to intravenous injection.

You only need a cursory knowledge of basic metallurgy to know that all of the alloys in common use as atomizer coils will leach molecules, shed particulates, and off-gas at vaping temperatures - even true at room temperatures just /a lot/ more slowly. Just glowing your Kanthal coils you can witness the aluminum leach out and catch fire - I have more than once. Aluminum is extremely bad for human being and studies have shown correlations with all sorts of ailments from heart disease to mental illnesses even including early onset dementia and Alzheimer's disease. Many metals affect the brain and aluminum is one of the worst. Not nearly as bad as lead or mercury but still very bad.

Nichrome currently perhaps the most commonly used today, is likely on par with Kanthal as far as health is concerned. N80 for example is about 80% Nickel and about 20% chromium - two quite poisonous heavy-metals and both bad for the brain as well as other internal organs. The word "about" in this paragraph, is used with the given percentages because there is also going to be 1% or 2% manganese and 1% or 2% silicon. Lower Nichromes like Nichrome 60 (N60) starts incorporating large percentages of iron, So N60 looks like: 60Ni-20Fe-18Cr-1Mn-1Si (about 20% iron (Fe)) and N40 would be written: 40Ni-38Fe-20Cr-1Mn-1Si (about 38% iron) and so on.

Stainless Steel and in particular "SS 316L" as it was or is perhaps the most commonly sold to vapers, is composed of the following:

Chromium:	16–18%
Nickel:	10–14%
Molybdenum,	2.0–3.0%
Carbon:	0.03% (max)
Manganese:	2%
Silicon:	0.75%
Phosphorus:	0.045%
Sulfur:	0.03%
Nitrogen:	0.1%

The percentages here listed by weight, not volume or some other. The remainder is entirely of iron. The non-L SS 316 is just a tiny bit more carbon up to about 0.08% instead of no more than 0.03%.

Stainless Steel 304 isn't that much different if not a tad safer for the exclusion of molybdenum - something you don't really even want to get on your skin when in a fine powder. The SS304 composition again by weight, looks like:

Carbon:	0.08% (max)
Chromium:	18 - 20% (most is 18%)
Iron:	66.345 - 74%
Manganese:	2% (max)
Nickle:	8 - 10.5% (most is 8%)
Phosphorus:	0.045% (max)
Sulphur:	0.03 (max)
Silicon:	1% (max)

The NIST 123d variant of SS 304 has been determined by several studies to be the safest form of Stainless Steel to work around in various manufacturing environments. But "safest" still does not mean "safe".

None of these wires are safe to vape on for extended periods over years or decades and it would be my guess that various medical and mental issues will manifest with prolonged use. Just like smoking, someone can smoke for 20 to 60 years and sometimes the person will show no signs of affectations and yet statistically a certain number absolutely will become ill as a result. The statistics can be expressed as a ratio like 1 out of every 50 in such and such a period of time or they can be expressed as a chance such as: you increase your chances of illness X by 50% after so many years of whatever.

So what's the ideal, what IS safe? Well, I would say pure silver (NOT sterling silver) wire would be better than any of these so far mentioned. It's dead soft and super easy to work with! Studies show that it actually may have some health benefits but no adverse affects have been found. Even better than silver would be smelted Electrum which some people call "White Gold". Also very easy to work with, it is just an alloy comprised of gold and silver. Better yet again would be gold wire. It's extremely easy to work with but you may not be able to preheat the coils before wicking and therefor you won't be able to /easily/ clean then by heating - at least not without the risk of melting the wire. And again ingestion of gold molecules has only shown positive or no health affects to date. Even maybe better and likely the ideal of over all would be platinum! Platinum should be 100% safe or even healthy to vape on with it's only downside being the initial expense. A single ten wrap platinum coil contains about \$15 or \$20 worth of wire. But at the same time will or /should/ last for years.

Here are some youtubers messing around with platinum, silver, and gold atomizer coils:

- <https://www.youtube.com/watch?v=cdCRsKzvzq8> (Gold)
 - <https://www.youtube.com/watch?v=FZG7ENK0W3U> (Gold, non-English)
 - https://www.youtube.com/watch?v=0G_XYC-RzJI
 - <https://www.youtube.com/watch?v=5SHPFQNH2t0>
 - <https://www.youtube.com/watch?v=Ed0ue7CKYQg>
-
- KidneyPuncher carries silver wire BTW: <https://www.kidneypuncher.com/silver-999-dead-soft-wire/> with the Electrum, Gold, and Platinum types easily locatable on Ebay, Amazon or other retail web pages.