

Maybe you've noticed, but wires are really important to us.

We use them a lot.

And so, I you just saw in a cartoon with electrons.

Here is a cartoon that I thought was interesting that shows a wire-pulling setup.

So, now this is-- Die, reducing the diameter.

That's a die.

Further reduction can take place using extra dies.

The drawn wire is finally wound on a spool.

This transformation elongates the wire.

One meter of 5.5-millimeter wire rod can be drawn to 30 meters with one millimeter diameter or 484 meters with 0.25 millimeters diameter.

OK.

Now, that is a cartoon, and I think it's always good.

When you see cartoons like this, you don't know.

Go look up what the real deal is.

What does it really look like to draw wires?

And I found it pretty cool.

So this is an actual wire-drawing plant, and this is what it looks like.

Now, there's no audio here, but I just wanted to show you the magnitude.

Those are huge towers that are melting metals to give you this first rod, and then it goes through one after the other.

And look at it being pulled-- being pulled in at some diameter, and it comes out in a different diameter.

But I wanted to show you the scope and size of this.

This is just one of them.

There's a person, and so you get a sense of the size, and then you can also see something-- when you go visit these factories, and I have these factories, there's always a lot of this happening.

Why?

Things are getting really hot.

When you're spinning things like a wire at a very high velocity, things heat up, so you get water all over the place.

So there's water being sprayed in factories all over the place, because you've got to keep stuff cool, or there's water baths that you run these things through.

And then you've got to think about, well, does this thing interact with water?

How does the water play a role?

It all comes down to the electrons.

And once they've actually drawn the wire out over this huge factory, they can actually weave it back together.

So I found this.

This is the same factory.

Now these things here are doing the opposite.

So these are huge drums, about the size of a person, and each of these got a wire that was drawn.

And now, again, because of the ductility, you can also move the wires, play with the wires, and you can weave them together.

You can weave them right back together into a thread that looks like that, which we all have seen I think many, many times.

All of this processing, all of this manufacturability, has to do with the electron sea.

That's why we have wires OK.