



DIY carbon tape heated trousers

by [Shenzhen](#) on January 31, 2015

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Intro: DIY carbon tape heated trousers

If you only knew, how nice to hang around for hours in the cold winter, laying in the snow, sit on a cold snowmobile or on icy log... if you wear heated trousers:)

I made them in 3 hours. Maybe you could do it even better, all in your hands!

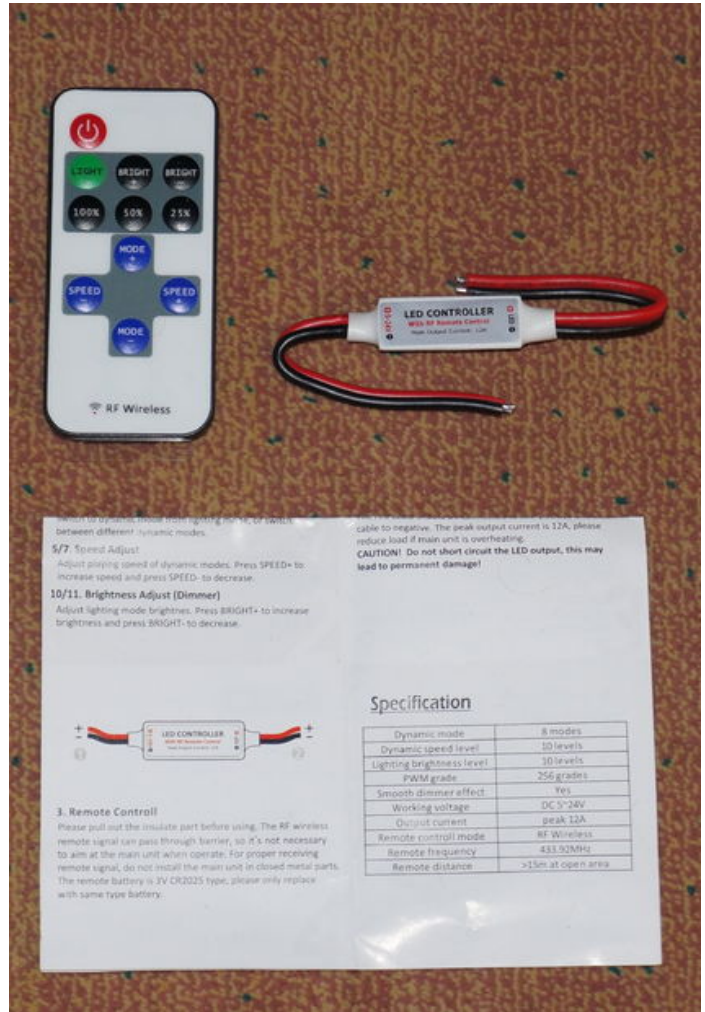
Look how easy it is.



Step 1: Shopping List

- 1.) 2 pair of inexpensive sport trousers in local store.
- 2.) 4.8 meters (16 ft) of 15 mm carbon fiber heating tape.
- 3.) 3 meters (10 ft) of 18 AWG ultra flexible wire. Conductor Type:150/0.08
- 4.) A silver glue.
- 5.) Thread and needle.
- 6.) RF dimmer.
- 7.) 12 v battery or any power source.
- 8.) 5 meters (16 ft) of Iron-on no-sew hem tape.





Step 2: A little theory...

The main advantage of carbon fiber tape is resistance to repeated bending.

Unlike a nichrome wire heater or similar, carbon tape provides uniform heating since it is much wider. In addition, it is very soft to the touch like a normal cloth and doesn't interfere in the clothes.

That's why it often used in heated clothing.

Look at the table. You can find the carbon tape length for needed temperature at 12 Volt.

I chose 38 degrees Celsius, so cut 1.2m of 15 mm carbon tape (4 pieces) and connected them in parallel.

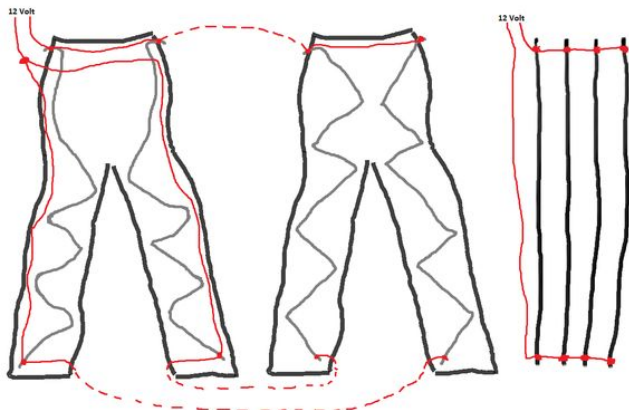
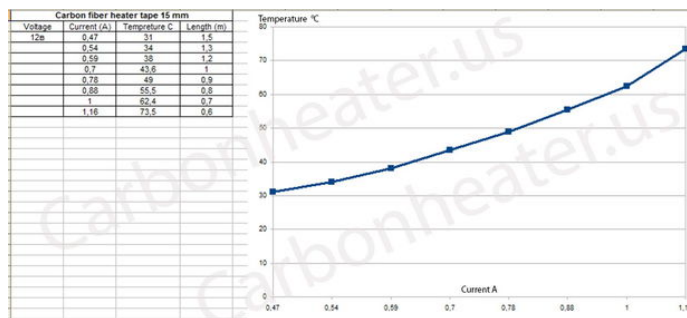
1 piece of carbon consumes 0,59 Amper so 4 pieces:

$$0,59 \times 4 = 2,36 \text{ A.}$$

My 18650 batteries have 3,4 A/h so the run time is:

$$3,4 : 2,36 = 1,4 \text{ hour.}$$

I've bought a RF dimmer and can smoothly change the power. On 50% it lasts more than 3 hours.



Step 3: How to place carbon tape

I put the tape zigzag to uniformly heat up. Under the carbon tape put iron-on hemming web tape. Gently press the carbon tape with an iron that is stuck to the fabric.

As you can see, I used only four pieces of carbon tape (two for front and two for back). You can make your own drawing to better heat where you need it. For example, you can use 6 pieces of tape to make the heat more evenly.



Image Notes
1. FRONT



Image Notes
1. BACK

Step 4: How to connect carbon tape

Sew the wire. Strip the end of the wire and twist.

Apply a little silver glue on the end of carbon tape. Attach the wire at the top and sew it tight. Apply the silver on the tape and wire. Allow to dry 30 minutes and apply silver again to make contact more reliable. Connect the RF dimmer if you would like make it dimmable.



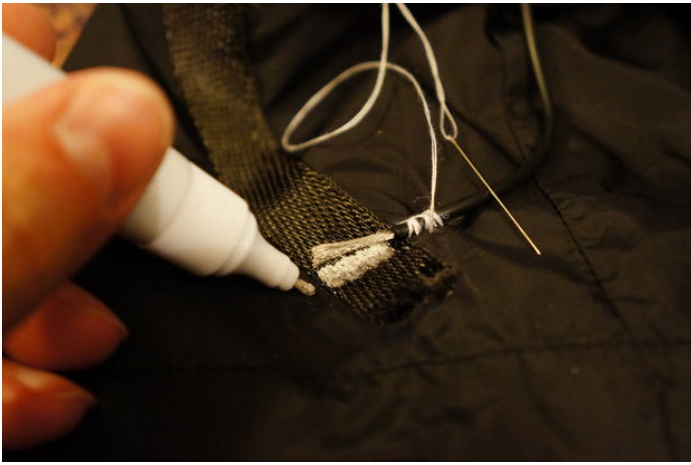


Image Notes
1. FRONT



Image Notes
1. RF DIMMER

Step 5: Cover the carbon heater tape

The carbon tape is an open wire. To avoid short-circuiting the tape needs to close with some insulator, for example, another cloth.

Put on top the second trousers. Make a little hole for the connection wires and put them out.

Sew legs and beits together.



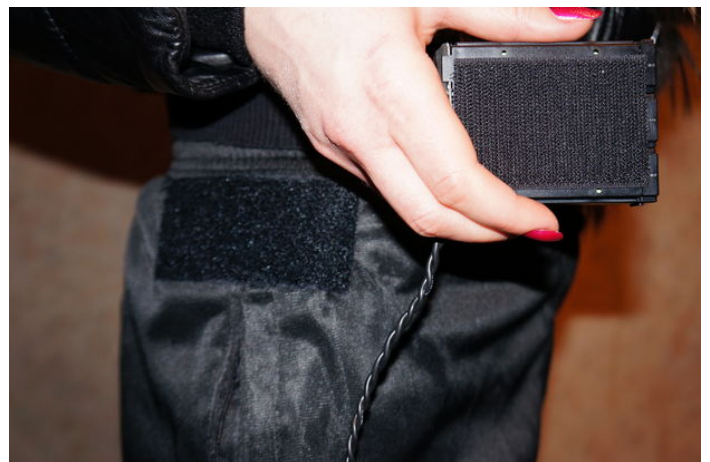
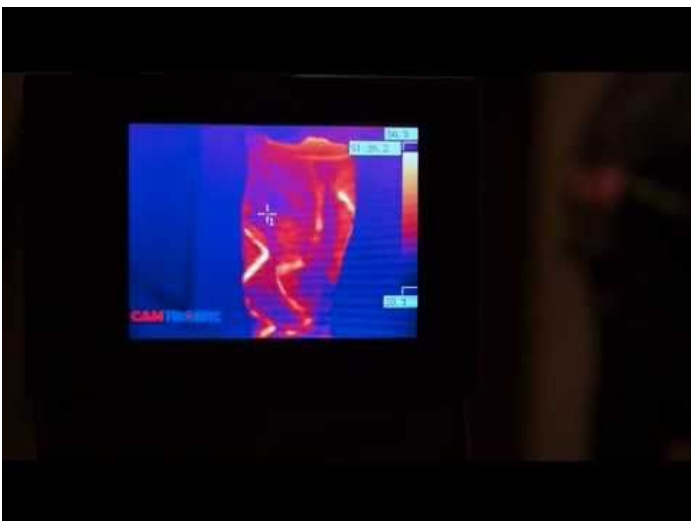
Image Notes

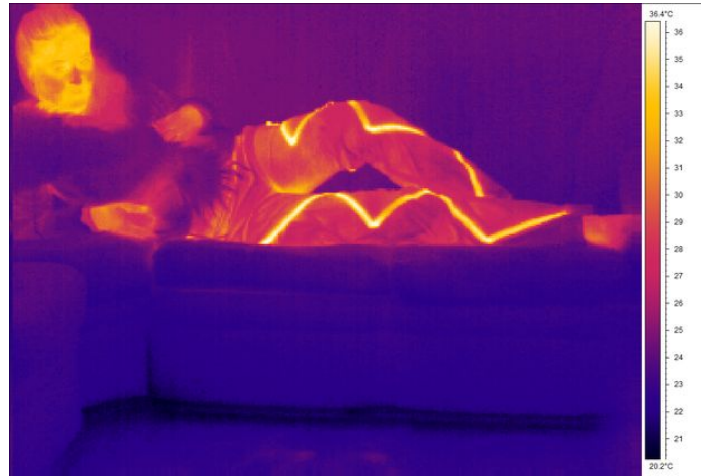
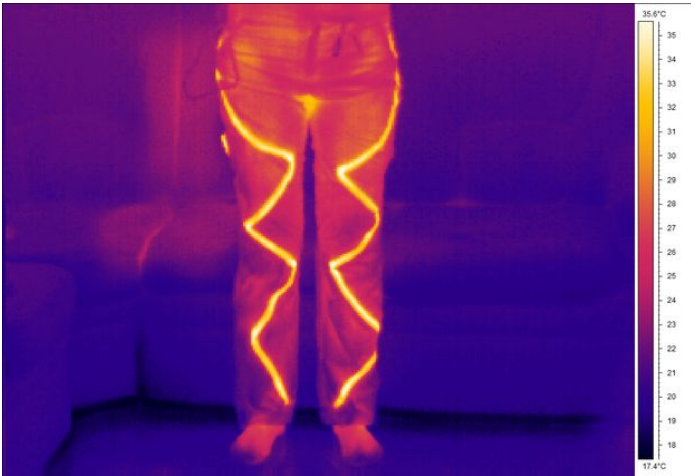
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Step 6: Power it!

You can just put the battery in your pocket, or use the velcro and stick it to the belt.

DIY carbon heated trousers ready. Click on the button and you will be warm and comfortable in any cold!





Related Instructables



DIY carbon tape Taser-proof jacket by Shenzhen



DIY carbon tape heated vest modular system by Shenzhen



Winter bike clothing for less by PKM



DIY carbon heated insoles by Shenzhen



DIY carbon tape heated vest by Shenzhen



DIY carbon tape heated gloves by Shenzhen

Comments

[4 comments](#) [Add Comment](#)



Justa Jakobi says:

I love it, and I happen to have the controller already, but I am concerned about what will happen if it gets soaking wet.

Feb 7, 2015, 5:37 PM [REPLY](#)



Attmos says:

Ah, you live in the cold part of Russia. I wouldn't have asked if I knew. Very cool, or maybe very warm :)

Feb 7, 2015, 5:10 PM [REPLY](#)



Attmos says:

Very cool; but why would I want to spend hours laying in the snow or on an icy log? What is it that you do that inspired you to make these?

Feb 7, 2015, 4:58 PM [REPLY](#)



Shenzhen says:

Long and cold Russian winter, long roads, large drifts, snow-covered fields and forests:)

Feb 7, 2015. 5:03 PM **REPLY**