Invisibility Shield

by IanCharnas

So, you want to make an invisibility shield, eh? Of course you do! Who wouldn't want the ability to become invisible? Watch the video above to see the fun you can have with an invisibility shield made from a sheet of Lenticular Lens. Are you excited yet?!

Get started making your own by ordering your supplies:
**Supplies:**

- [Quantity 1] Lenticular Lens Sheet: 40 x 28 inches (711 x 1016 mm)
- [Quantity 2] Liquid Optically Clear Adhesive: 50 ml, low viscosity, you need 2 vials
- [Quantity 1] Polycarbonate Sheet: 1/8 x 48 x 48 inches (3.2 x 1219 mm)
- [Quantity 1] UV Lamp: 100 W
- [Quantity 4] Optically Clear Adhesive Sheets: Any size is OK, you need 4 sheets
- [Quantity 1] Rubber Roller: Optional, but highly recommended for the glue process
- [Quantity 1] Film Removal Stickers: Optional, but recommended for working with OCA sheets

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https://youtu.be/uuM_KVs3xnM

Step 1: Cut the Polycarbonate

First you need to cut your shield and handles out of your piece of polycarbonate, following my PDF drawing (below). You can use a CNC table router if you have access to one, or you can use a hand-held router, reciprocating saw, bandsaw, circular saw, handsaw, or even a well trained beaver with sharp teeth who likes a good challenge.

Special Note for CNC or Hand-Held Routers: It's fine to leave the internal corners rounded. Mine were, and the results were great! The little radius was barely visible when compared to the overall size of the part. I used an 1/8 inch diameter O-Flute bit from Onsrud, it cuts sooo goood.
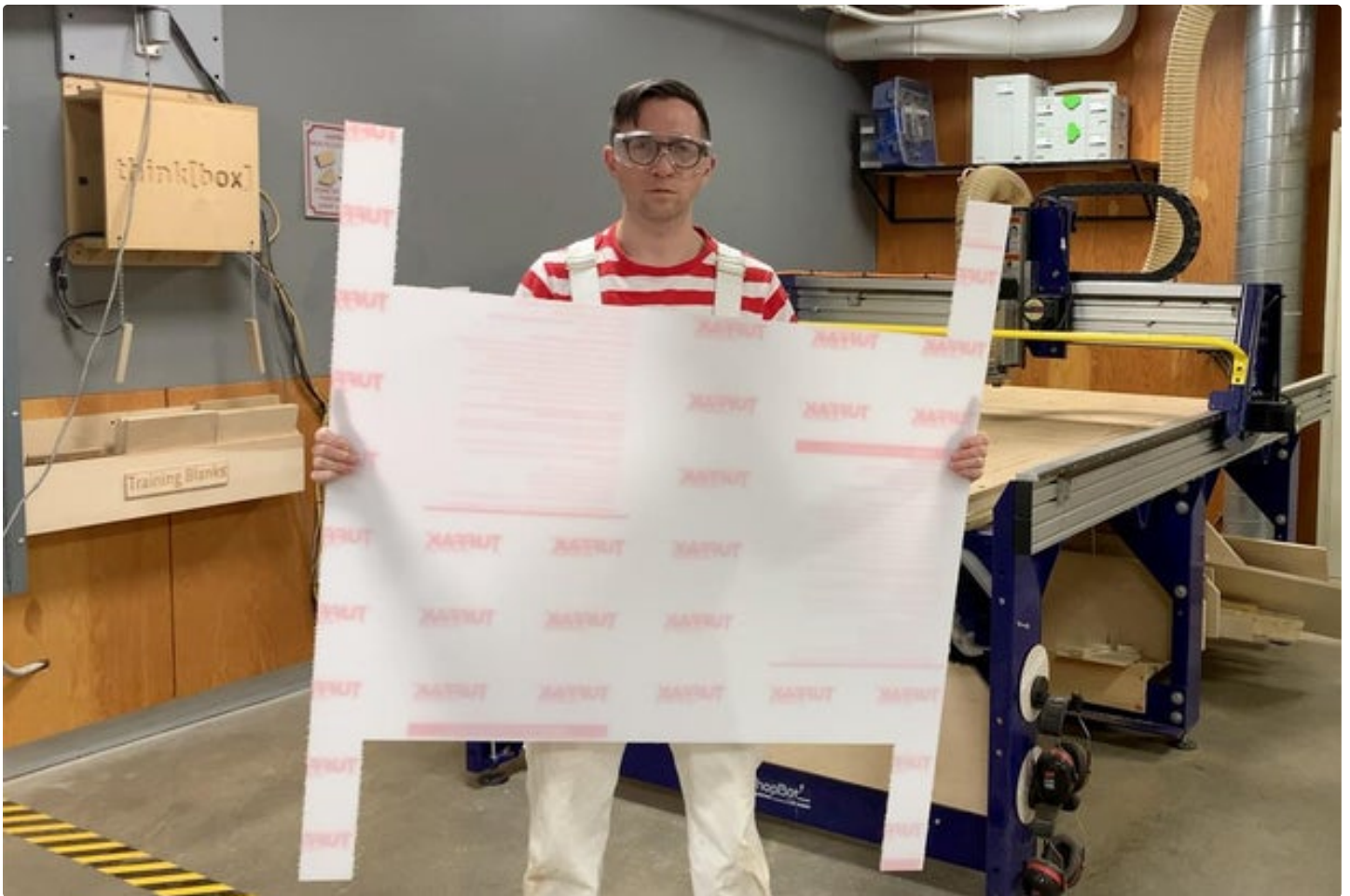
Step 2: Bend the Tabs

Next, bend your tabs back. The exact angle is not important, just bend them far enough so that you can't see them when you're looking at the front of your shield.

What's that? You've never bent plastic before? With most plastics it's pretty difficult, but you're in luck because you're using polycarbonate! This plastic is really easy to bend and you don't need to heat it or do anything special, just bend it! While you're bending, you might feel afraid it's going to snap.... but don't worry, it won't snap because polycarbonate is special like that. It's the bendable plastic of your dreams!

I bent my tabs using a bending machine called a finger brake, but you can use a shop vise or whatever you have available to you. I even bent one of the tabs just using my bare hands during my prototyping process. I just tapped into some leftover teenage angst and pushed with all my strength and it bent! I'm not a super strong person. As you can see in the photos my body was mostly designed for typing, so you can probably do it too.

Step 3: Glue the Lenticular Lens to Your Shield

Remove the oddly satisfying plastic film from the front of your shield, and set it on some boxes or whatever you have nearby to raise it off the floor.

Make sure your shield and lenticular sheet are clean of dust before you proceed. I wiped mine with a microfiber cloth sprayed with alcohol, but you can also use a paper towel.

Next, take your two 50 ml vials of Optically Clear Adhesive, and spread the glue on your polycarbonate in the pattern you see in my photos. The pattern helps prevent air bubbles. To get all the glue to come out, you'll need to push the plunger all the way into the vial using a pen or stick or whatever's handy.

Now, carefully place your lenticular sheet onto the glue. The lenticular sheet has a smooth side and a side with ridges. Make sure to place the smooth side against the glue, so the ridges are facing away from the shield.

Use your hands (or a roller, if you purchased one) to push down **HARD** on the lenticular sheet and force the glue to spread out and fill the entire air gap between the polycarbonate and the lenticular sheet. If you see an air bubble in the glue, press down hard and squeeze and push that bubble to the edge of the sheet where it will pop and disappear. Special Note: The roller makes this much, much easier because it concentrates your forces to produce a higher pressure. I hope you bought the roller! I did the first one without the roller and my muscles were really sore the next day.

The glue gets everywhere so when you're done, carefully clean any glue mess from your shield using a paper towel or microfiber cloth soaked in alcohol.
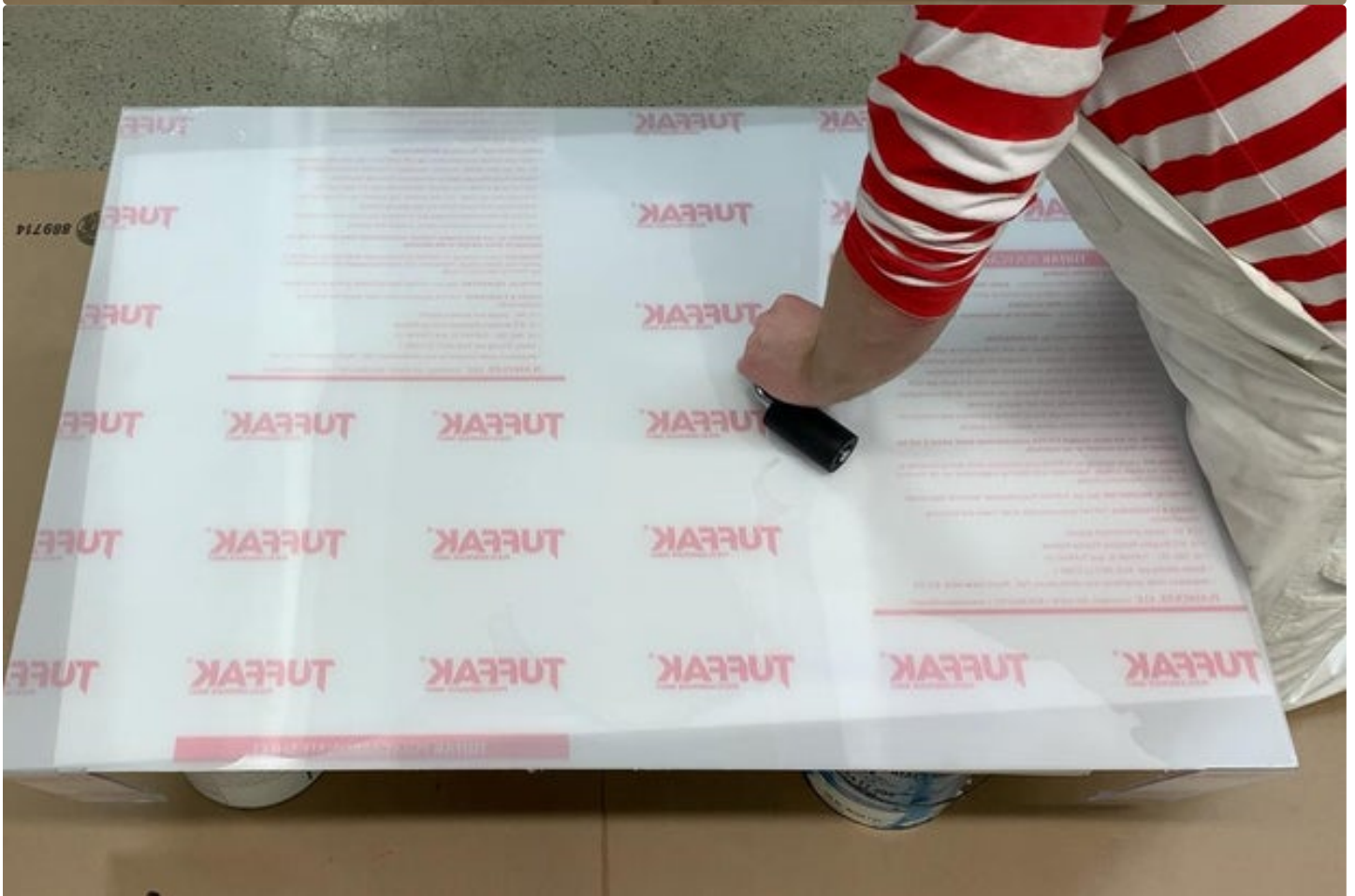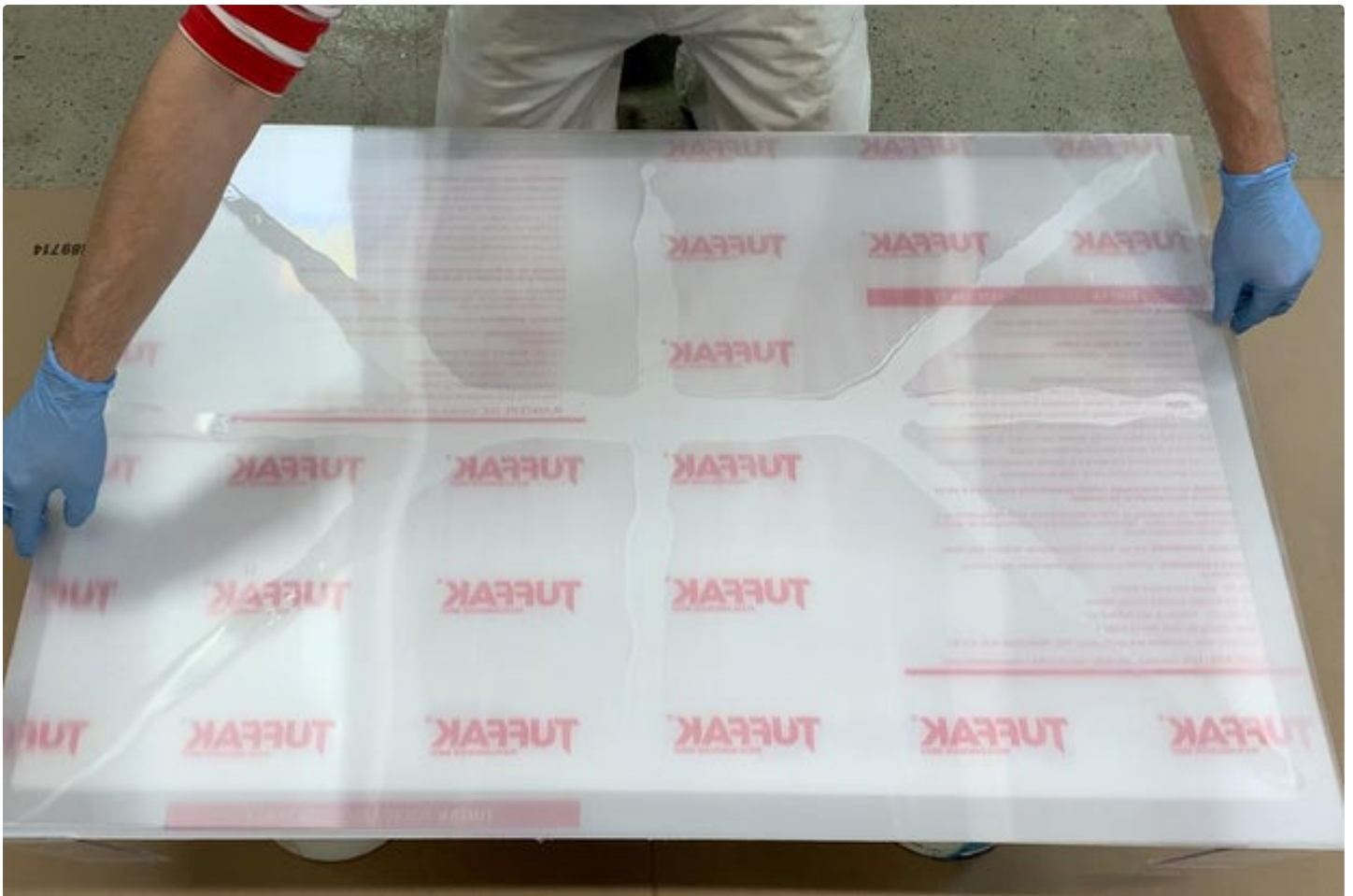
## Step 4: Cure the Adhesive With UV Light

Hang your UV light above your shield. I used a backdrop stand and some spring clamps, but you could use a broom handle suspended across two stools, or whatever you have handy. The UV light should be about 10 - 20 inches (25 - 50 cm) from your shield. If your light is too close, the light won't spread to the edges of your shield.. but if it's too far, the light won't be concentrated enough to cure the glue.

Turn on the light and let the adhesive cure for 24 hours. Depending on how powerful your light is, you might find that some adhesive towards the edges of your shield is not hardened even after 24 hours. If so, move your light above the uncured section and wait another 24 hours.

Finally, remove the last layer of protective film, and clean any last bits of uncured glue with a microfiber cloth or paper towel soaked in alcohol.
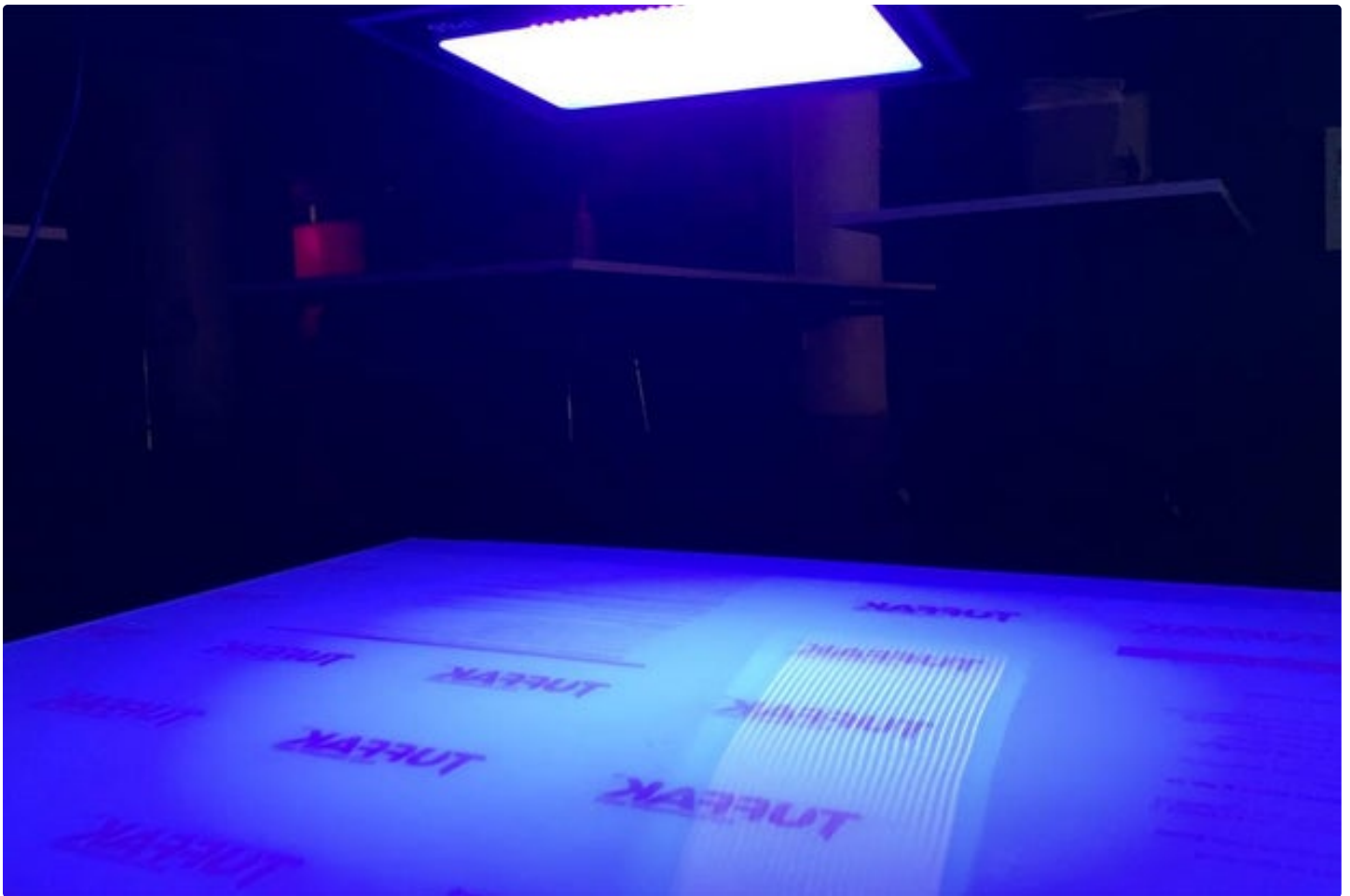
Step 5: Attach the Handles

Cut your Optically Clear Adhesive (OCA) sheets so that they are about 1/4 inch (6 mm) less than the width of your tab. This will make it easier to align.

Your OCA sheets have not one, not two, but THREE glorious protective films. Remove the first two layers (the widest and second-widest) of protective film to expose one side of the adhesive. Now stick the OCA sheet to the tabs and press down hard to get a good bond.

Next you need to remove the final protective film from the OCA sheet. This one is super hard to get with your fingernails. You can do it by carefully using a utility knife or hobby knife to peel it back, but be prepared for a little frustration. Instead, if you bought the optional OCA film removal stickers, stick one to a corner of the film and press it down hard with your fingernail to get a good bond, then slowly peel back the film and you'll see how amazingly easy this step is with the right tool (the film removal stickers).

Finally, remove the protective film from your polycarbonate handles and stick them on to your tabs. Press down super hard with your fingers to make sure the adhesive sheets bond well to the polycarbonate.
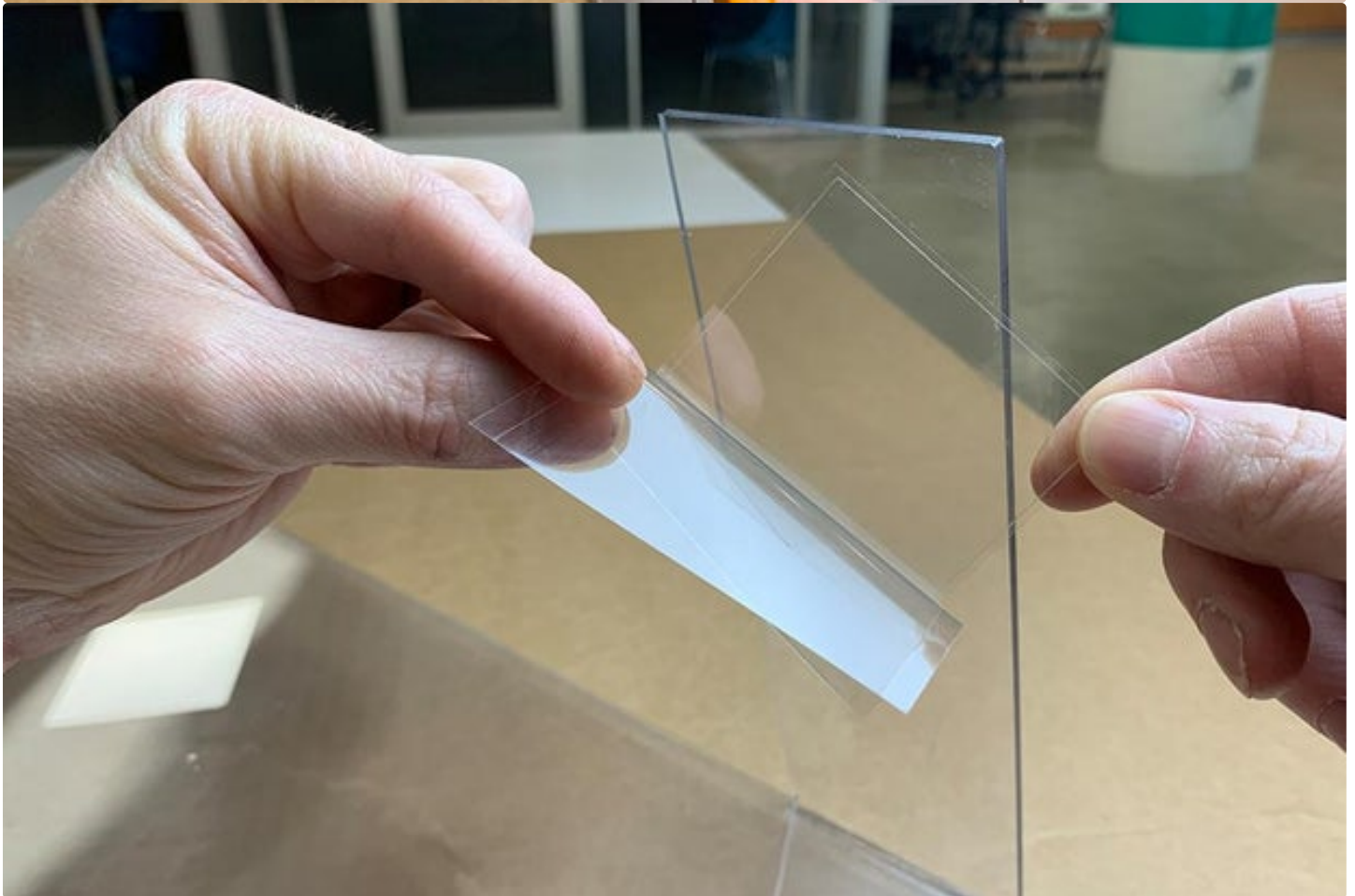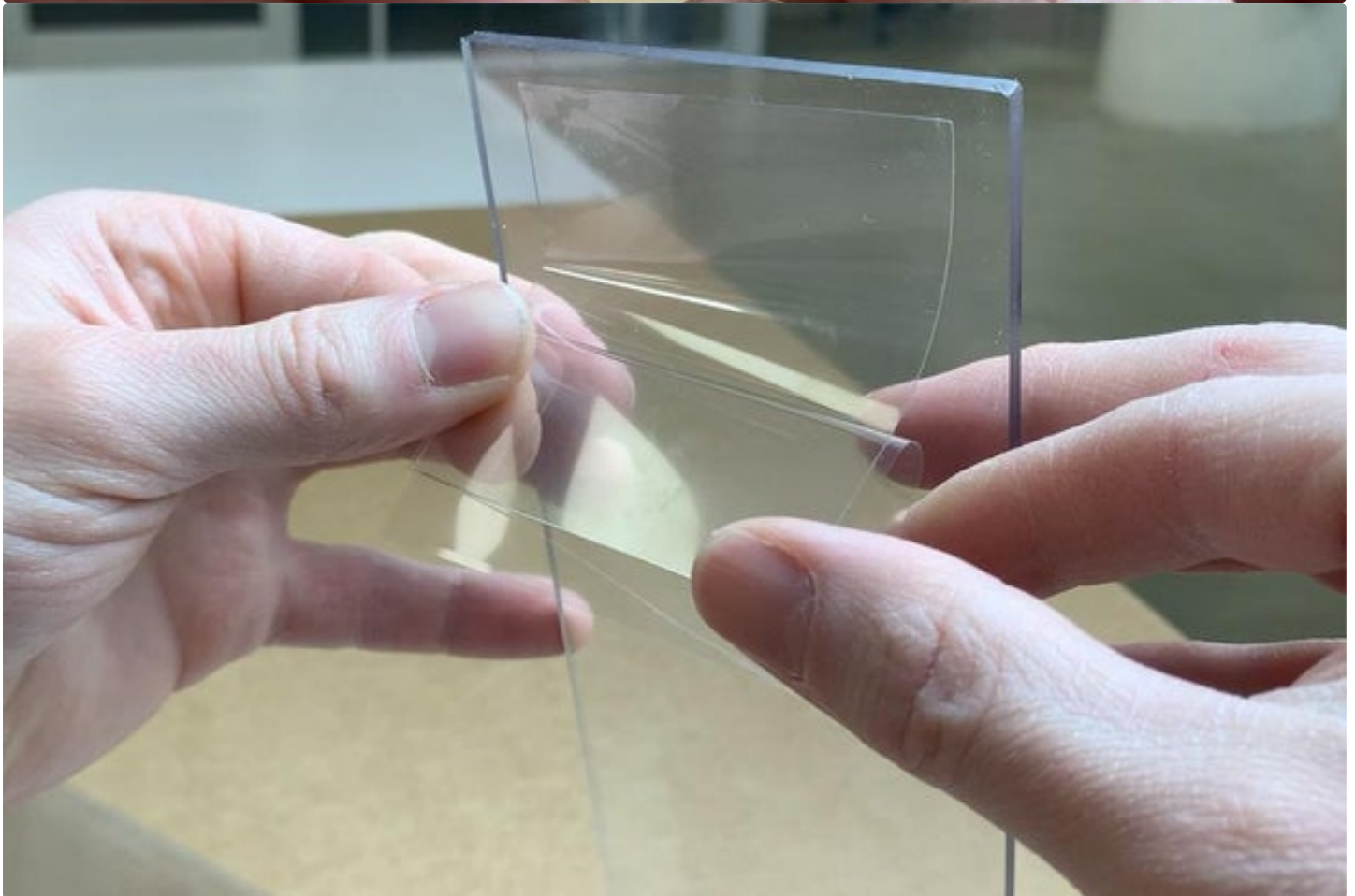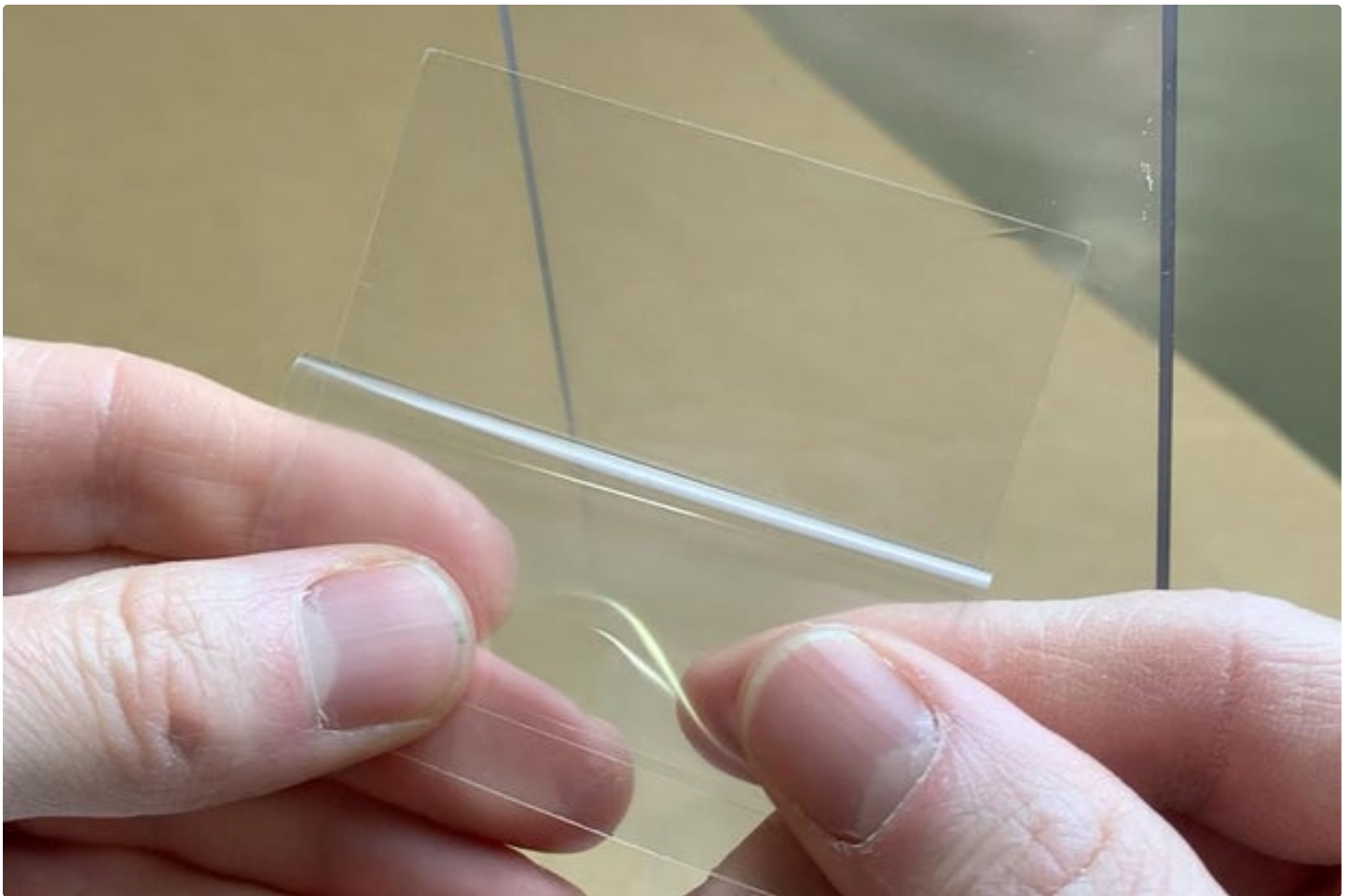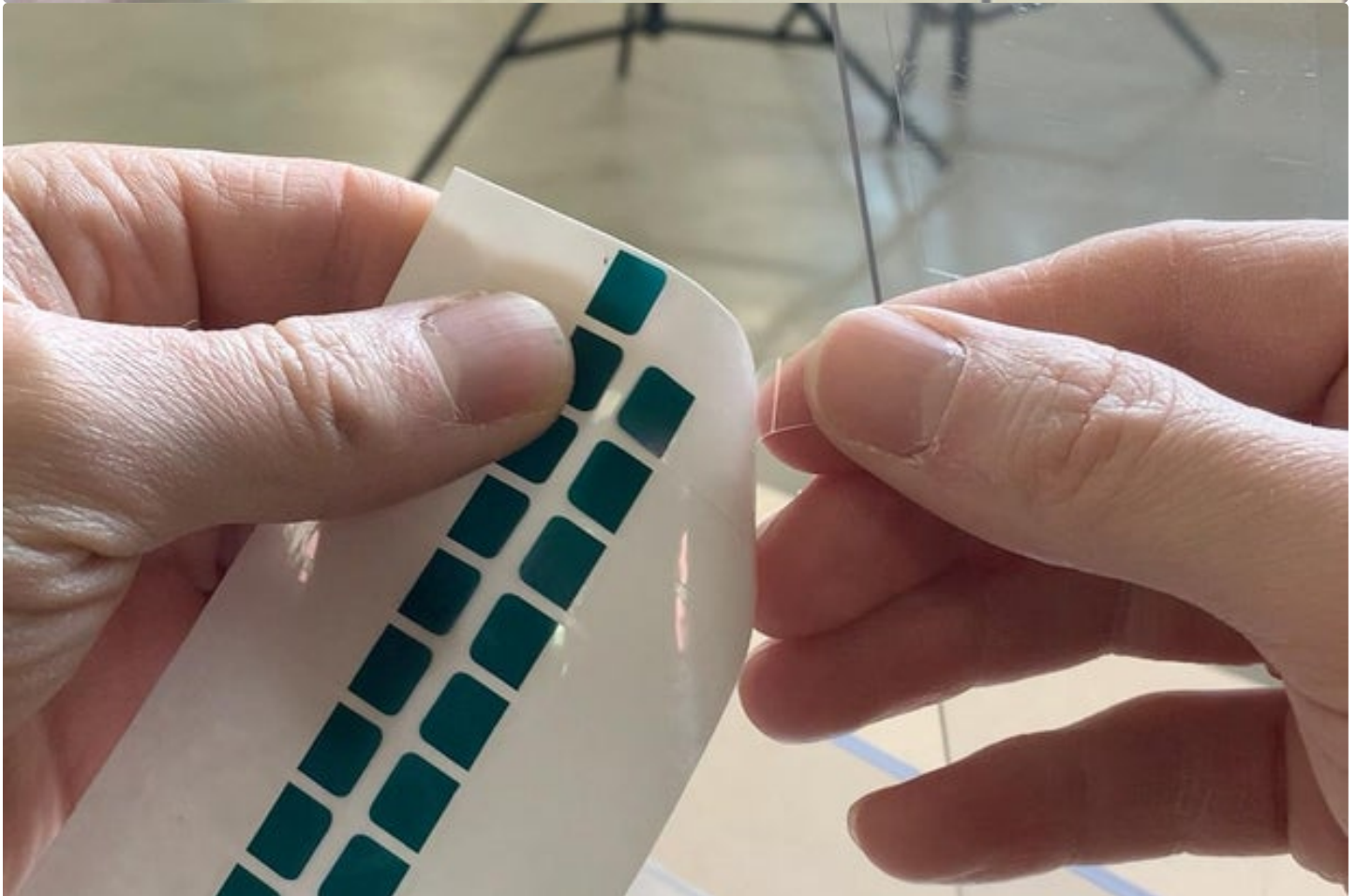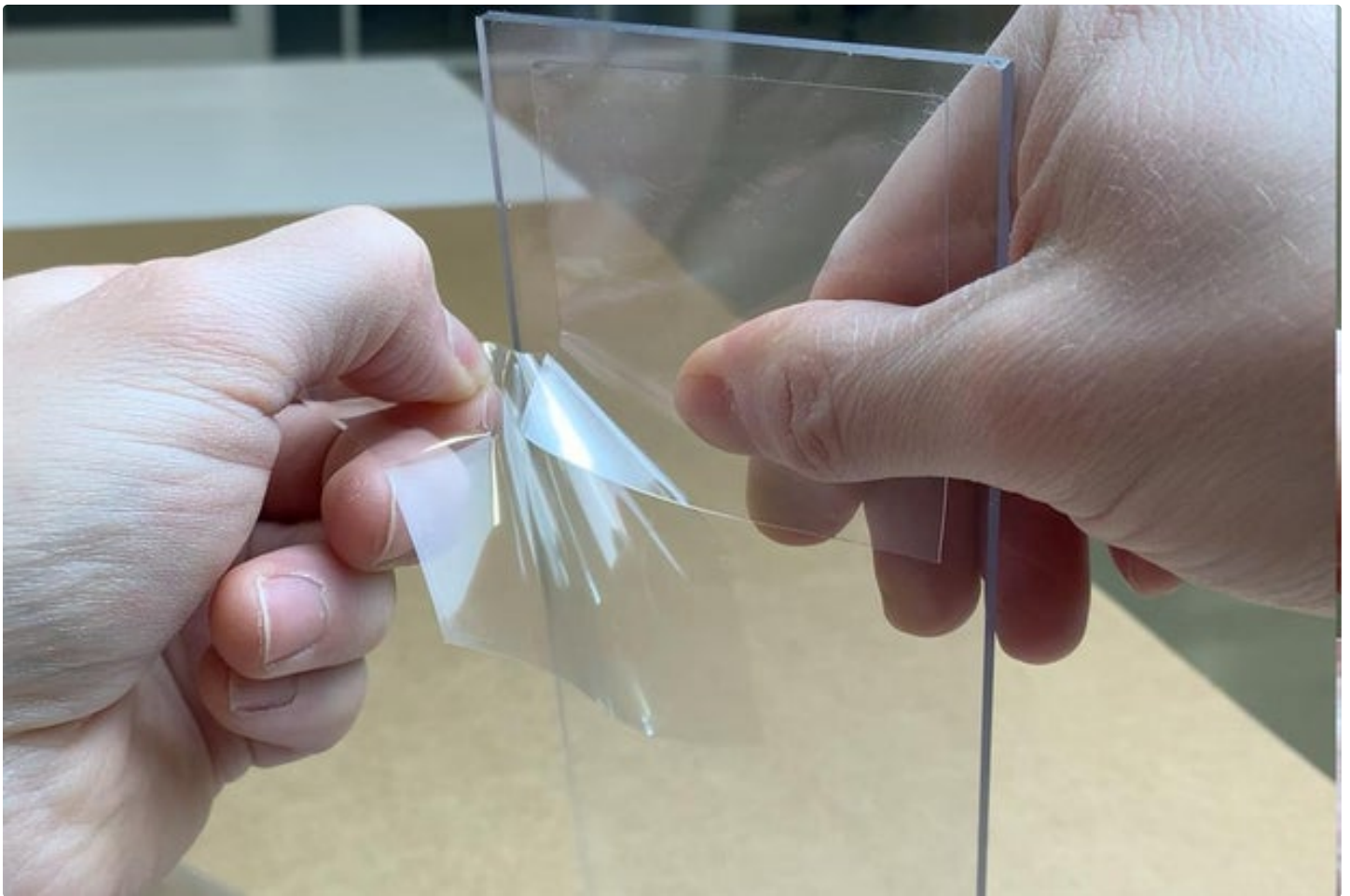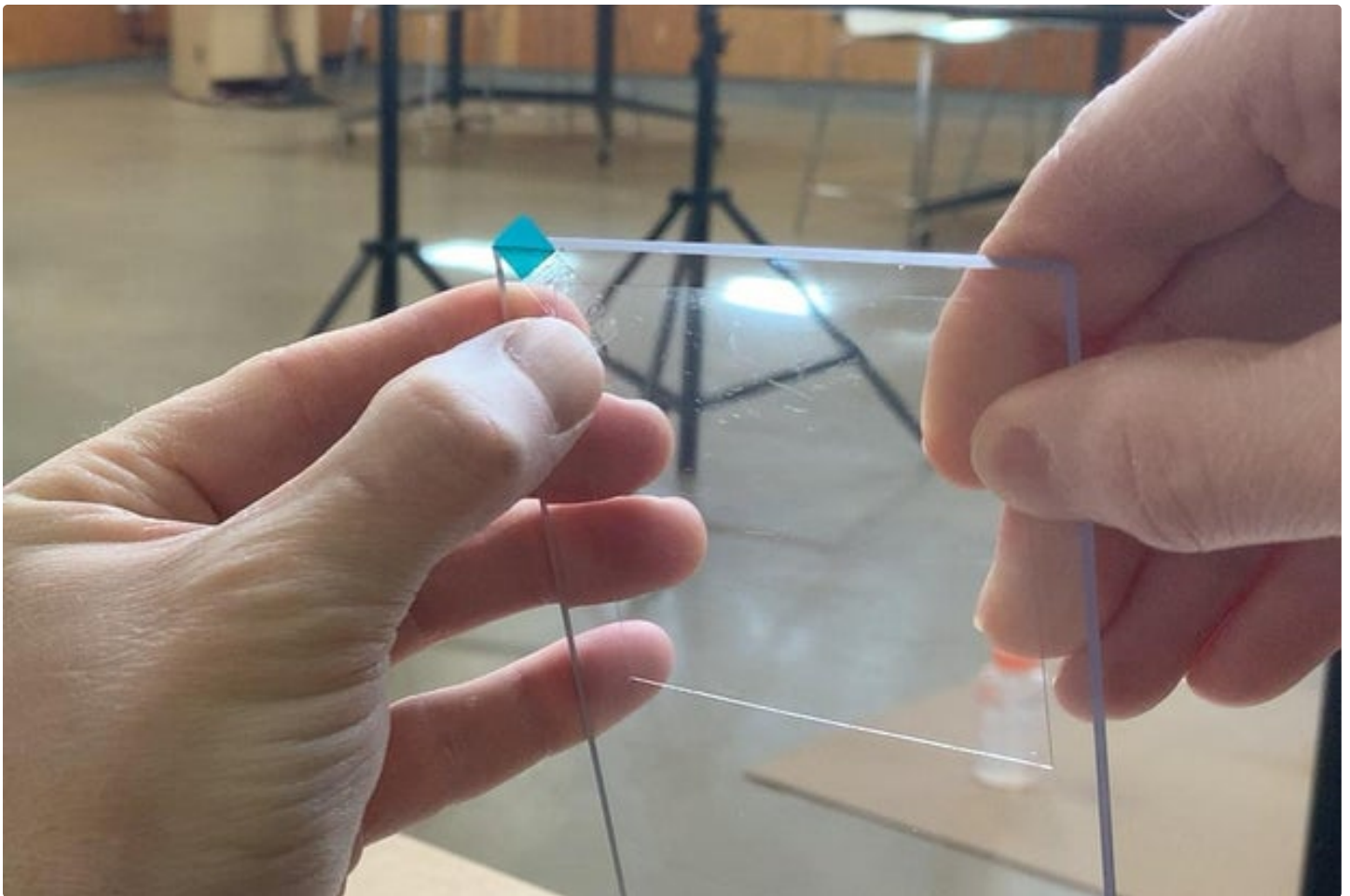
Step 6: Become Invisible!

Have fun becoming invisible. Remember, with great power comes great responsibility.

This magical illusion is pretty easy to use, as long as you follow this one weird trick: The background really needs to have strong horizontal stripes. It could be stairs, aluminum siding, bricks, a chair rail on a wall somewhere, a dark TV on top of a single-color stand, really anything that has clearly visible horizontal stripes.

To see more of my fun projects, follow me on YouTube, Instagram, Twitter, Facebook, or subscribe for email updates when new projects come out.

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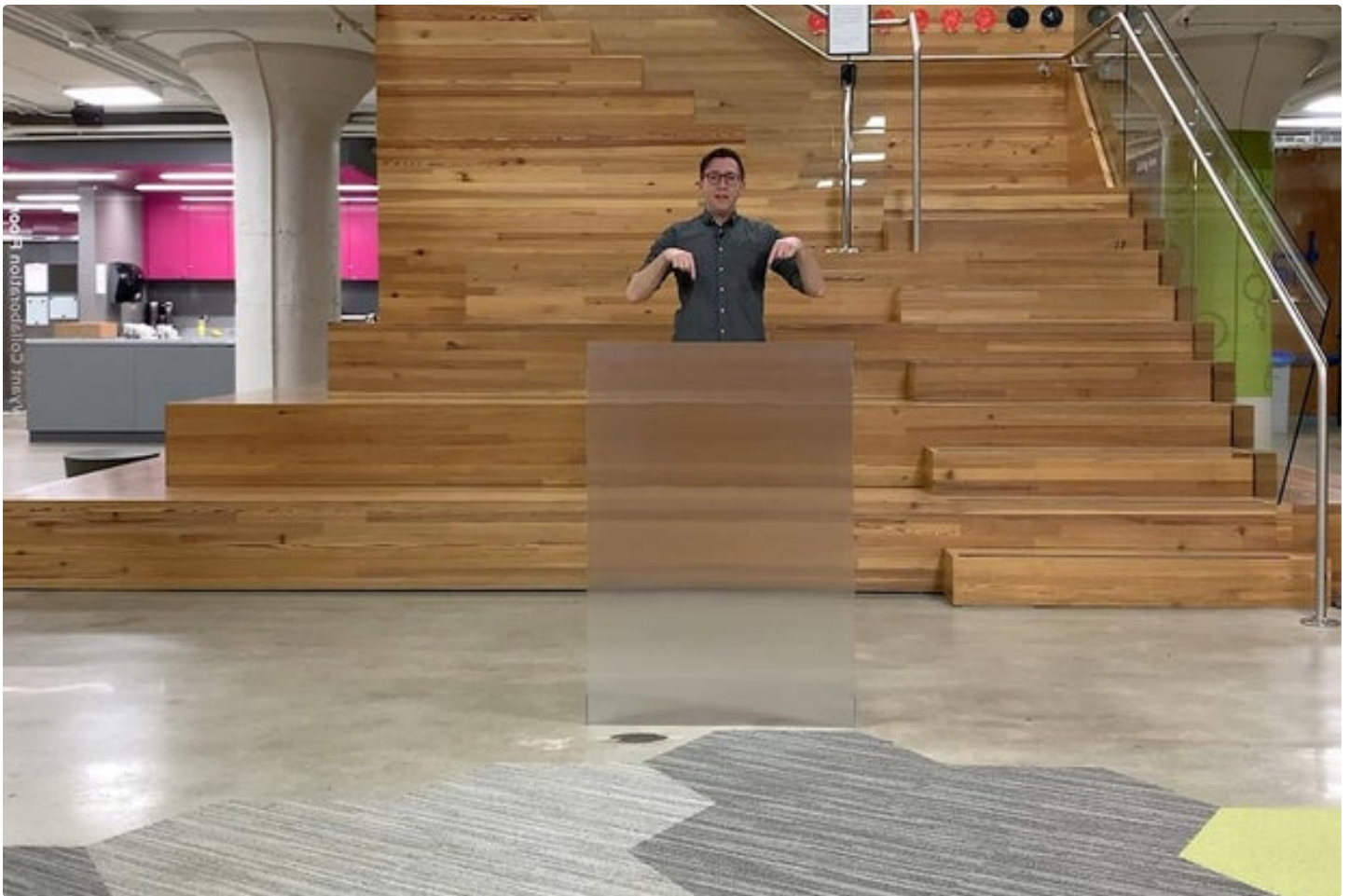
Awsome I use it in hide and seek

I like this. I wonder if I could hide my house.

Amazing!! My mouth was literally open all the time..
Want to make this one but don't have things to make it.. So sad..☹
Thanks for sharing!! :D

Same! I was speechless!!!!!

No worries. If you have a laptop you can do one of this kind. Check out the link:

https://www.instructables.com/What-If-I-Get-an-Invisibility-Cloak-As-in-Harry-Po/

Yay! I'm so glad you enjoyed it :-)

Some people are just buying the lenticular sheets and playing around with them by holding them up with their hands. You don't necessarily need to make the polycarbonate structure.

https://www.etsy.com/listing/924360012/large-lenticular-sheet-for-invisibility

Good one. Really liked the idea. Do check out my earlier try of this kind:

https://www.instructables.com/What-If-I-Get-an-Invisibility-Cloak-As-in-Harry-Po/

Let me know, after you tried this as well. Thanks!

It was so fun to do this!

Thanks Sophia!!!

You're welcome 😇!!!

Your wellcome!

Cool how you added to perfecting this idea, also good and very funny video :)
A while ago I took apart an LCD tv, in the back there was a stack of plastic sheets that remind me of the material you used, they also refract the light.
I still have them somewhere because I liked the effect a lot and have (occasionally) been thinking what to do with them, Maybe I could try to make a small invisibillity shield (or even Some invisibillity armor lol) I'll take a look if the material will be suitable for this application thanks for the inspiration!

Hi Gadisha, I'm really happy you enjoyed it! I think the LCD material is polarizing filter. It won't work as an invisibility shield, but there is a cool trick you can do where you remove the filter from the front of an LCD, and afterwards you can only view the screen if you are wearing polarizing sunglasses. It's a great trick! Enjoy.

LCD backlights also often use Fresnel prisms to increase their brightness (e.g. https://multimedia.3m.com/mws/media/721803O/vikuititm-brightness-enhancement-film-bef-iii.pdf), and those are indeed similar to your lenticular screen. But they just show what is at two discrete angles behind them, rather than combining the light from many angles as your lenticular screen does, so they would probably not make a good invisibility shield.

Thanks for the info! I didn't know that about LCD backlights using fresnel prisms. Very interesting.

Thanks for your reply :)
Too bad the polarizing filter won't work, I guess I'll find another project to use it for, but thanks for telling me what it is ;)

Also thanks for sharing that trick, I did'nt know that, seems fun.

Nice idea! I would like to make it as well as your shield!

Thank you so much! Here is the special material if you want to play around with a sheet of it: http://etsy.me/3nsrixE

Some of the projector screen TV's if I understand correctly, Fresnel Lenses are a linear type and not the circular ideal point solar concentration type. If I understand correctly, those specific linear types of Fresnel Lenses are a lenticular design. There is also a 3D LCD TV that uses a lenticular design (I just checked to verify): https://en.wikipedia.org/wiki/Lenticular_lens
Not certain if the design is rounded or triangular and the effect on the invisibility perception.

James, great points! Yes I remember seeing some youtube videos of people using circular Fresnel Lenses taken from projector screen TVs as solar concentrators. I didn't know that there was a 3D LCD TV though, I'm going to go check that out. A+ for dropping the knowledge James!

Your very welcome and thanks for sharing! I recall someone using the projector screens and I've not been able to find the video on Youtube. Greenpowerscience however, notes in I think more than one of his videos about the difference in the Fresnel and other lenses from the projection screen TV's and how challenging to find (if not making somehow by polishing off a layer or something like that) the circular pattern since many of the designs are the linear pattern. Ah, just looked and found one of the videos regarding the lens patterns and conversion: https://www.youtube.com/watch?v=zjrB9wbJfMw

WHERE IS WALDO???
Nice instructable. Above my shops level of tools. one thing, I hope my wife doesn't sell my stuff for what I told her I paid for them... <(*;*)>

wheres wally

This. Is. So. Dope.

wheres wally

OMG thank you so much!

This is really awesome, you seem like an phenomenal teacher (assuming that's what you do?) and an above and beyond first instructable! Well done!!

Hi Mr Erdreich, thank you so much for those super kind words! I really appreciate it.

So well done. Thank you for making invisibility shields even better!

Hi! Thank you so much for the super kind words :-)

This can be made at home. Amazing!

I'm so happy you enjoyed it :-)

Brilliantly worked on and created I love the fact that you wear in some of the picture's a red striped top and glasses reminding me of wears wally something because of your creativity and learned knowledge you are not. well done many a stage illusionist would love to use to there advantage.Thank you for sharing

Michael, thank you so much! I'm really glad you enjoyed it. :-)

Your welcome.. I was serious about creating a stage illusion ;^)

Such a cool project, and one of the best videos I've ever seen!

Oh my gosh thank you so much! I really appreciate it.

hey Randomn on youtube did this first why could you give him credit

Justin, thank you for the comment and you are correct - Randomonium worked with material before I did. He was inspired by a Canadian company called Hyperstealth, and they themselves were inspired by Lubor Fiedler - a magician born in 1933, who first popularized this effect. I mention all of this in my video and give proper credit there. Have a watch and let me know how I did! I hope you agree that I've made some worthwhile improvements over prior attempts at making these. https://youtu.be/uuM_KVs3xnM

This idea is very good and funny

Thank you so much! I am really glad you enjoyed it.

Such a great idea. Thanks for sharing

Hey thanks Snorlax! 9 out of 10 blue-green pokemon agree :-)

Totally :)

jaw drops in shock OMG OMG OMG how?!?!?!? (I mean, I know how because you just explained it, but so cool!) My harry potter club friends will loose. it. My brain has now melted with happiness and absolute shock. Great job you genius.

This is like the sweetest message ever, thank you so much! I am feeling the warm and fuzzies :-)

Congrats on the feature man! Great project! :) Voted! :)

Thanks Geeksmithing!!! I really, really appreciate it.

IMPRESSIVE!!!
thank you for the instructable

Hey thank you so much for taking the time to add a nice comment like that!