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NEW STUDY SHOWS HOW CHARGEABLE WOODEN FLOORING CAN POWER ELECTRICAL DEVICES

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The new system allows wooden flooring to be electrically charged with footsteps, which powers light bulbs and other small household devices

Spotted: Scientists from ETH Zurich have developed a wooden flooring system that generates energy to power electronics. The system has already been demonstrated by powering a lamp with footsteps.

The study, published in the journal *Matter*, shows how the innovative charging system consists of two thin layers of treated wood with electrodes layered below. As people walk across the flooring, the electrodes vibrate through what's known as the triboelectricity effect. In other words, electricity is generated by friction, leading to materials becoming electrically charged. We might recognise this effect when, for example, a balloon becomes electrically charged after rubbing it against hair, or when a moving car becomes charged thereby causing passengers to receive a shock when they touch the door handle.

Scientists experimenting with this new flooring system used one piece of wood coated with silicone that readily gains electrons upon contact. The other piece of wood was embedded with metal ions and organic molecules, more likely to lose electrons.

According to the researchers involved, the process caused the timber to generate electricity that was 80 times more efficient compared to natural wood. An A4-sized sheet of this flooring was sufficient to power both household LED lamps and calculators after being repeatedly pressed for a few seconds.

“Our focus was to demonstrate the possibility of modifying wood with relatively environmentally friendly procedures to make it triboelectric,” said the study’s senior author Guido Panzarasa.

He added that the spruce presents favourable mechanical properties as it is economical and easily available, potentially making it scalable on an industrial level. The next steps include developing the treatment of the wood to make it more environmentally friendly.

Written By: Katrina Lane

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Website: cell.com/matter/EA

Contact: ethz.ch/contact

Takeaway:

The sci-fi dream of generating electricity by walking on the street or by driving cars on the road is closer to being a reality. In 2017, the average household electricity consumption for a residential house in the US was 28.9 kilowatts per day. ETH Zurich innovation presents a significant step towards the next generation of sustainable power supplies in smart buildings.