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Is Compostable Furniture the Future of Sustainable Design?

Believe it or not, it's possible

By Katherine McLaughlin

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Compostable furniture might sound strange at first, but the idea isn't as far out of reach as you might think when considering the latest advancements in sustainable design. While digesting the concept of eco-friendly furniture, Jonsara Ruth wants you to think about wood. The co-founder and design director at Parsons School of Design's Healthy Materials Lab says this might be the simplest form of biodegradable furniture. "That's the one that everybody's familiar with," she adds. Sprouting from the Earth, wood can just as easily degrade back into it, nourishing the next generation of plants to grow. In fact, it's what it's supposed to do.

When discussed like this, your bed frame, table, or dresser aren't just aesthetic pieces of decor, they could be the beginning of a compostable furniture revolution. "We call it timber, we call it framing, we call it all kinds of things, but it's plant cellulose at the molecular level," Jonsara explains. "It's a plant and it biodegrades."

The term "compostable furniture" probably sounds futuristic, but really it's anything but that. "It takes a new way of thinking, which is actually a traditional way of thinking," says Elise McMahon, founder of LikeMindedObjects. "What seems kind of new and novel now is actually the way the world had been operating until the Industrial Revolution." Elise creates decor, furniture, clothing, and accessories through LikeMindedObjects with the goal to design with sustainable, circular systems. "I don't want to claim perfection though," she adds.

The case for mono-material furniture design

Whether a piece of furniture can biodegrade comes down to one thing: the material it's made from. "One strategy for biodegradable or recyclable furniture is for it to be mono-material," Elise explains. Many substances, like wood, may be easily recyclable or compostable when they're by themselves. However, when combined with other materials, as so many furniture pieces are, the product loses its ability to decompose.

For example, the reason so much of our wooden furniture isn't biodegradable at the moment is because it's coated in synthetic finishes, like polyurethane. "Basically what you're doing is you're coating it in plastic, so it slows down its ability to biodegrade," Jonsara says. However, if the product were coated in a plant-based oil like linseed or tung oil, the bigger issue, like the product itself, may one day disappear. Model No., a furniture company based in Oakland, California, uses bio-resins that compost easily over time to finish their products. Jeffrey McGrew, CTO and co-founder of the company, describes bio-resins as "smooth to the touch." He also notes that "the surface has excellent wear characteristics over time, so it still looks good after hard

Other regenerative materials

"If it is multiple materials, then the solution is how do you design it to be able to be disassembled and then recycled," Elise insists. This may mean using many biodegradable materials that can be separated from nuts or bolts and other non-compostable material before everything is recycled or composted in the proper place. Of course, this begs the question, what materials *could* be used?

Before being known as the man who designed the Bilbao Guggenheim, the starchitect Frank Gehry rose to prominence for his Easy Edges collection, a line of furniture made from corrugated cardboard and masonite. Cardboard, the primary material of all the pieces, takes about six months to decompose. The original collections included everything from gaming tables to bookshelves, but the Wiggle Chair, sold today by Vitra, remains as one of the most iconic and notable pieces of cardboard furniture, showing that paper is a viable material for furniture with countless applications.

Modern-day designers like Elise continue to find innovative ways to incorporate paper into interior products. "Paper is something that I feel strongly about as a material," she adds. Elise has produced a number of tables and chairs that incorporate industrial paper tubing and is looking to include it in future products as well. Molo Design, a Vancouver-based company, creates expandable paper stools, benches, and tables, among other interior products.

Besides paper and wood, cotton and wool could also become major players in future compostable furniture. Both can biodegrade in a matter of months, and already show up in other types of sustainable products like packaging or clothes. Though the opportunities are extensive, one practical way to include them in furniture would be through cushions.

As Jonsara explains, many chairs or couch cushions are made from polyurethane foam. "It's basically coming from the fossil fuels, which are really flammable," she adds. Because of this, manufacturers will add flame retardant chemicals, which are not only toxic for people but make cushions extremely hard to break down. It's a problem that Elise discovered while she was teaching upholstery classes in New York at 3rd Ward and Textile Arts Center in 2011 and 2012 and had students bring in pieces they wanted to reupholster. "It was a lot of 1960s, 1970s, and 1980s furniture, and the foam was the most unhealthy looking, synthetic material," she recalls. As one solution, LikeMindedObjects sells cushion inserts made out of shredded denim and discarded fast fashion textiles.

"One of the materials we're really interested in knowing a lot more about is mycelium," Jonsara says. The root system of mushrooms, mycelium can be cultivated before the fungus sprouts for use in various applications—everything from leather-like substances to construction materials. Artists and researchers like Phil Ross from MycoWorks are already harnessing the power of mycelium to make chairs, among other products. Maybe one day, we'll see a "leather" couch made from mycelium and stuffed with shredded textiles and cotton.

"It feels like suede on top of cork," Isaac Larose, co-founder of EDEN Power Corp explains. Eden's mycelium planters, bricks, and wine coolers are grown on hemp waste and can biodegrade in 60 days when broken up and put back into soil. The mycelium grows in molds and takes a couple of weeks to take the full shape. Chairs or other pieces of furniture are usually grown by the part, Isaac explains, and then assembled later. "It's pretty tough," Isaac says of the material.

Adital Ela, CEO of Criaterra Earth Technologies, uses earth and natural fiber to create a 100 percent recyclable and biodegradable material that's as strong as concrete. Right now, her company is making decorative wall tiles, and she has made stools and lamps from the material in the past. "We hope to come back to the possibility that it will be a material that will craft endless possibilities," she says.

Looking toward a compostable future

Though many pieces of furniture aren't fully compostable at the moment, it doesn't mean they can't be used to build a more sustainable future. As Elise explains, "the world has so many materials that have already been extracted from the environment, and I feel like we are obligated to utilize that material in future products."

This could mean a lot of things, but in a very practical sense, it may just look like shopping for second-hand or vintage furniture. Jonsara says that "this is one strategy for thinking about sustainability because then you're keeping it alive." As we move forward, Elise thinks that ideally, products that "could decay or disappear completely" should be created.

Still, the pieces will have to be designed like this from the start. "It's totally possible," Adital says. "It's about preserving the ability to reactivate the materials, either in a biological cycle or in a technological cycle, but only when you choose to do it." This last point is particularly important since few people probably want their furniture actively rotting while they're trying to use it.

"I don't feel like this is a revolutionary idea," Elise emphasizes. Since most of this is rooted in simple, traditional knowledge, she believes that looking back might be the best way to go forward. Elise adds, "We've been healthy consumers before, so how can we return to that?"