

CORK FURNITURE

(and other cork products)

A unique, sustainable alternative to wood



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INTRODUCTION

As designers search for new innovations and sustainability becomes increasingly popular in mainstream U.S. culture, the use of cork has been often overlooked until now. Just like other forms of wood, cork has been used for thousands of years. But cork use has been confined to its most well-known form: the stopper that plugs wine bottles. Other uses usually reserved for more common wood, such as furniture and flooring, could become more popular for cork, which has unique qualitative properties. And life cycle analyses show that using cork is more sustainable than other types of wood, satisfying the needs of both designers and the environment.

CORK BACKGROUND

Cork's unique qualities in comparison to other forms of wood make it an interesting and tempting design solution, even without regard to the environment. The finished product, which is about 82 percent air, has "memory" that allows it to bounce back from dents or depressions rather than chipping away or becoming compressed (Sustainable Flooring). It also absorbs sound well while resisting heat conduction, making it a beneficial choice for flooring in multifamily and office buildings. As a benefit for indoor environmental qualities, cork is hypoallergenic; it resists mold or mildew. Due to its lack of cracks or crevices -- as opposed to hardwood flooring -- it is easy to clean. And cork is impermeable to liquids or gases, allowing its use indoors or outdoors. This has implications for furniture and paving use not just inside and outside of homes, but also in public spaces.

The use of cork even just for wine bottle stoppers helps to make the cork industry huge for some economies in the western Mediterranean, where cork oak forests are prevalent. In Portugal, which produces 70 percent of the world's cork materials, cork processes constitute \$3 billion of the gross domestic product and employ 150,000 people (McGraw-Hill). In these cork oak regions, biodiversity thrives in concert with the special trees (Rainforest Alliance).

Survival of cork trees and their related ecosystems actually depends on their human use and intervention. Cork trees can live for an astonishing 170 to 250 years, as long as they are stripped every nine to 10 years (Rainforest Alliance). If the cork bark is not removed regularly, the tree ages much more quickly. Stripping after 10 years or so would damage the tree beyond repair. Failure to intervene threatens not just the survival of these trees, but the balance in the biodiversity they support. So unlike the removal of other trees for wood in the use of paper, furniture and flooring, using oak trees helps the environment instead of hurting it.

The presence of these trees has the same effect as other trees on greenhouse gases. Cork oak forests capture 5 percent of the carbon dioxide in their local environments (McGraw-Hill). Portuguese cork forests drained 4.8 million tons of carbon dioxide last year, and all cork forests in the Mediterranean likely drained about 14 million tons of the greenhouse gas (Real Cork).

Cork trees do not need to be torn down for their use, but simply stripped of their bark. Once the cork is pruned, it is laid in the sun to dry. This is more environmentally friendly than large-scale kiln drying often used in wood production. The cork shavings are then ground up, sorted according to size and thus post-industrial use and then sent to nearby manufacturing plants (Sustainable Flooring). At this point, cork may remain largely a raw material (as in wine bottling), or receive a veneer or some sort of other treatment common with other wood furniture or flooring.

Few people realize that cork harvesting does not hurt the environment. Supermarkets, worried about oxidation and leaking from wine bottle corks, have been pressuring winemakers to use less-sustainable synthetic bottle plugs (Rainforest Alliance). This movement alone, according to the Rainforest Alliance, threatens Portugal's economy as well as natural forest ecosystems in western Europe. Partially as a result of this, the Rainforest Alliance has joined forces with the Forest Stewardship Council to make a special emphasis to use their Smartwood program to certify sustainable cork growers. It recently awarded a forest sustainability management certificate to Fruticor, which manages more than 2,200 acres of cork land (Rainforest Alliance). Both agencies are also encouraged the U.S. Green Buildings Council to adapt its LEED accreditation process to allow more points for certificates such as the SmartWoods designation.

CORK LIFE CYCLE ANALYSIS AND PRODUCTION PROCESS (WITH COMPARISON TO OTHER WOOD)

1. Extraction

The differences in harvesting cork compared to other woods is by far the most crucial element in the entire life cycle assessment, and much of it has been explained already. But clearly, non-cork wood harvesting is far more damaging because it requires tree removal. Uprooting even one tree requires the local ecosystem to adapt (McGraw-Hill). Although wood may be renewable because trees can be replanted, keeping trees maintains an ecosystem continuity and prevents disruption of habitats and soil erosion. There are also tremendous energy costs in the amount of work and machinery needed to deforest entire regions.

2. Manufacturing

Wood is more difficult to transport than cork, in part because of manufacturing locations. The agglomeration of the corking industry in the Mediterranean allows transportation over shorter distances for the raw, ground cork material to reach cork manufacturers (McGraw-Hill).

As noted in the general description of cork, the material is very versatile. Its manufacturing obviously depends on its use, but probably much more so than wood. Cork in the manufacturing stage can be very sustainable if kept almost strictly as a raw material. But the color, shape, size and texture of cork can be easily manipulated with additives (McGraw-Hill). Certainly, the amount of additives used or manufacturing alterations that require more energy factor into the life cycle analysis on a case-by-case basis.

3. Construction

Due to splintering, wooden furniture almost always requires some sort of laminate or veneer and additional manipulation in the manufacturing phase; cork needs less treatment. Both cork and wood need adhesives but not necessarily finishes.

The cost of transporting cork to its resting location may be higher, however, for U.S. citizens. Most cork is produced in the Mediterranean and has higher shipping costs compared to wood, which is produced in masse in multiple locations. Consumers or contractors have little choice in shopping around by territory for the cheapest wood type, but do have the choice in choosing the most sustainably treated type.

4. Occupancy and Maintenance

As mentioned, cork's qualities make it easy to clean and avoid damage compared to other wood materials. As a result, cork is extremely durable and often comes with 15-year warranties when used as flooring (McGraw-Hill). Some buildings, such as the Library of Congress, still have their original cork floors from more than 100 years ago (McGraw-Hill). A replacement is usually not necessary if the cork receives a sanding and lacquer application every 10 years (National Pollution Prevention Center). There is discrepancy on how long the average cork floor without little chemical application lasts, however, and may be only about 30 years in some cases (Althaus). Cork furniture generally lasts as long as wooden furniture, although it is less susceptible to damage and thus less likely to be disposed.

5. Disposal and Reuse

Cork fares similar to other types of wood in this category. After being used as furniture or flooring, both materials are removed in the same manner and may both be recycled into new products. Cork, as a more versatile material, is easier to ground up, however, and mold into something new.

CONCLUSION

Cork fares similarly to other forms of wood in all stages of the life cycle analysis except extraction. But it is the extraction that, in this case, is overwhelming difference in sustainability between cork oak trees that do not need to be torn down and other trees that are removed from the environment. This factor alone, and the associated greenhouse gas implications and destruction to local ecosystems, outweighs all the other factors and inevitably makes cork use more sustainable than wood use. However, consumers should use caution and research cork products that are made sustainably with as few additives as possible.

Availability and price may be the only things keeping cork from being used more often. For instance, the replacement and installation of a cork floor costs 2.4 times more than the doing the same for some other flooring surfaces. But the maintenance and occupancy costs are 10 percent less expensive during an estimated 50-year life of the floor (National Pollution Prevention Center). Cork furniture is also more expensive than wooden furniture, due in part to its rarity and probably because it is sold more often by artists charging an overhead than by wholesale furniture stores. But if the public catches on to not only the unique design benefits of cork but how much it helps the environment, cost will likely subside with demand.

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