

Life Cycle Inventory of Carpet Products

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About 4 million tons of post consumer and industrial textile and carpet waste are generated each year in the US. As a result, an enormous amount of synthetic waste is disposed in landfills each year. The supply chain of the carpet products includes many chemicals, such as, nylon6, nylon66, polyethylene, latex, and calcium carbonate etc. Production of all these chemicals also consumes energy and generates waste. Therefore, the environmental burden and impact of carpet product is a complex system. Four types of carpets: PVC tile, polyolefin tile, styrene-butadiene latex broadloom, and polyurethane broadloom carpet, are studied and compared. The environment burden and impact of the Cradle-to-Grave life cycle of carpet product is evaluated and analyzed using life cycle assessment (LCA) methodology. For tile carpets, we find polyolefin tile weighs about 1/3 less than PVC tile but consumes more energy in production process than PVC tile. After considering the supply chain of both carpets, polyolefin tile has less over all energy consumption than PVC tile from a life cycle point of view. Heating and drying units are the major energy demand operation units in carpet manufacturing. Therefore, broadloom carpets are more energy efficient than tile carpet because broadloom carpets weigh less than tile carpets. Results from the LCA show that improvement of heating efficiency in carpet manufacturing can significantly reduce the environmental impact of carpet product.

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