Frammar BEAN-e-doo Mastic Remover

Product Selection and Description

BEAN-e-doo Mastic Remover is a soybean based product used to remove asbestos mastic, carpet mastic, and ceramic tile mastic. The user pulls up the flooring, pours BEAN-e-doo onto the surface, and after about one h, scrapes off the softened mastic. BEAN-e-doo has no odor and rinses away with water.

For the BEES system, the function of mastic remover is removing 9.29 m^2 (100 ft^2) of mastic under vinyl or similar flooring over a period of 50 years.

Flow Diagram

The flow diagram below shows the major elements of the production of this product, as it is currently modeled for BEES.

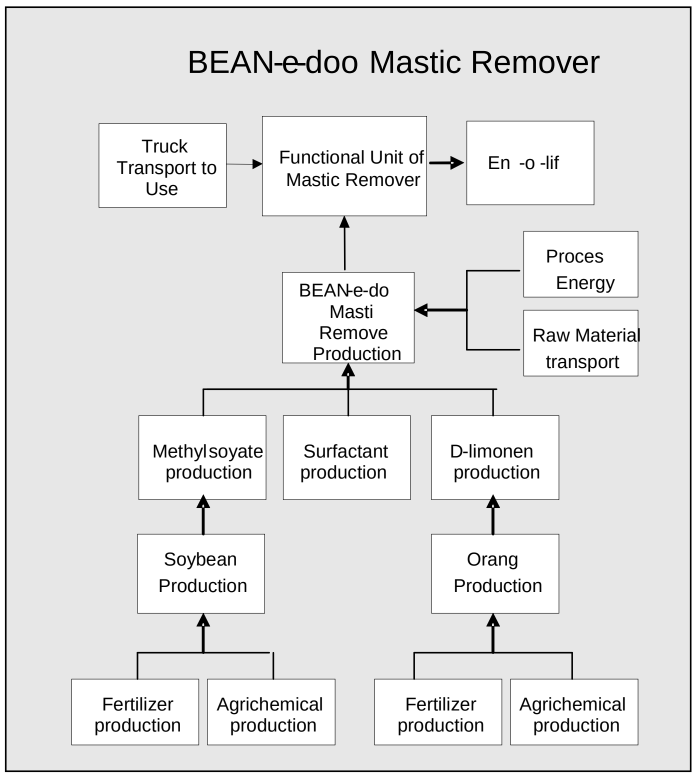

Figure 1: BEAN-e-doo Mastic Remover System Boundaries

Raw Materials

BEAN-e-doo is made up of the materials shown in the Table below.

Table 1: BEAN-e-doo Mastic Remover Constituents

Constituent	Mass Fraction (%)
Methyl soyate	85
Nonionic surfactants[1]	14
d-Limonene	1

[1] Names of surfactants not released to protect the confidentiality of company data.

Data for methyl soyate originates with soybean production data from the U.S. LCI Database. Data for the production of soybean oil and its further transformation into methyl soyate comes from a National Renewable Energy Laboratory LCA study on biodiesel use in an urban bus.[2] While data for production of the nonionic surfactant compounds in the product is unavailable, data for producing alcohol ethoxylate (AE) is used as a proxy.[3] D-Limonene is the major component of oil extracted from citrus rind; for production data purposes it is considered a coproduct of orange production. As such, it is assumed to comprise 0.5 % of the total mass of useful orange products, which include orange juice, cattle peel feed, and alcohol. Orange data comes from a variety of sources.[4,5,6]

Manufacturing

Energy Requirements and Emissions. Manufacture of BEAN-e-doo consists of pumping the components together into a 1.14 m^3 (300 gal) container, then draining the container. Production energy is required for pumping, but no heating of the product is required. For each 3.8 L (1 gal) of product, 0.004 MJ (0.001 kWh) is the estimated energy requirement based on the size of the pump. Electricity is modeled using the U.S. average electric grid from the U.S. LCI Database. Approximately 0.04 m^3 (10 gal) of water is included in the model to account for rinsing the tank between several production batches.

Transportation. Methyl soyate is transported approximately 322 km (200 mi) to the BEAN-e-doo facility. D-limonene is transported approximately 1931 km (1 200 mi), and the surfactants are transported about 64 km (40 mi). All materials are assumed to be transported by diesel truck, which is modeled based on the U.S. LCI Database.

Transportation

Diesel trucking is the mode of product transport from the BEAN-e-doo facility to the customer. The transportation distance is, by default, 805 km (500 mi), but this distance can be adjusted by the BEES user. Diesel trucking is modeled based on the U.S. LCI Database.

Use

According to manufacturer instructions for vinyl mastic removal, one gal of BEAN-e-doo may be applied to up to 18.6 m^2 (200 ft^2) of flooring, so 0.002 m^3 (0.5 gal) is modeled for removing 9.29 m^2 (100 ft^2) of mastic. It is assumed that BEAN-e-doo is applied twice to remove mastic over a period of 50 years. Data on water requirements or potential effluents from rinsing the product are not available.

End of Life

After BEAN-e-doo has been applied and mastic removed, they are both assumed to be disposed of in a landfill. However, while they are disposed together, only the mass of the BEAN-e-doo is accounted for at end of life.

References

Life Cycle Data

National Renewable Energy Laboratory (NREL): *U.S. Life-Cycle Inventory Database*. 2005. Golden, CO. Found at: http://www.nrel.gov/lci/database.

PRé Consultants: *SimaPro 6.0 LCA Software*. 2005. The Netherlands.

Sheehan, J. et al., Life Cycle Inventory of Biodiesel and Petroleum Diesel for Use in an Urban Bus, NREL/SR-580-24089 (Washington, DC: U.S. Department of Agriculture and U.S. Department of Energy,

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[2] Sheehan, J. et al., NREL/SR-580-24089 (Washington, DC: US Department of Agriculture and US Department of Energy, May 1998).

[3] Dall'Acqua, S., et al., Report #244 (St. Gallen: EMPA, 1999).

[4] National Agricultural Statistics Service, 2005. Found at: http://www.nass.usda.gov:8080/QuickStats/index2.jsp.

[5] Reposa, J. Jr. and Pandit, A., "Inorganic nitrogen, phosphorus, and sediment losses from a citrus grove during stormwater runoff" (Melbourne, FL: Civil Engineering Program, Florida Institute of Technology). Found at: http://www.stormwaterauthority.org/assets/023PLreposacitrus.pdf.

[6] Extrapolation of data for agricultural products from the U.S. LCI Database.

May 1998).
Dall'Acqua, S., et al., Life Cycle Inventories for the Production of Detergent Ingredients, Report #244 (St. Gallen: EMPA, 1999).
National Agricultural Statistics Service, 2005. Found at: http://www.nass.usda.gov:8080/QuickStats/index2.jsp
Reposa, J. Jr. and Pandit, A., "Inorganic nitrogen, phosphorus, and sediment losses from a citrus grove during stormwater runoff" (Melbourne, FL: Civil Engineering Program, Florida Institute of Technology, date unknown). Found at: http://www.stormwaterauthority.org/assets/023PLreposacitrus.pdf.

Industry Contacts

Dan Brown, Franmar Chemical, Inc. (September 2004)