Inspiring spaces

Martela

# Martela and the environmental impact of products

**Martela products are mainly made of wood, metal and plastic**

Martela uses wood from commercially grown forests. The most commonly used wood material particle board which can be produced from the sawdust created as a by-product at sawmills. The environmental effects of wood are caused by forestry, transportation, processing and the management of material efficiency in different production stages. Wood can be burned after use to utilize its energy content, however this also releases the carbon dioxide absorbed by the tree. Wood is a renewable resource, which means that for each tree that is cut, a new one is planted in its place and it will absorb carbon dioxide as it grows. However, in the Northern countries, it takes a lifetime for one tree to grow to full height.

The metal most commonly used in Martela products is steel in different forms. The environmental effects of steel are created by the land use of the mining industry, metal enrichment processes, transportation, and the management of material efficiency. Metal treatment processes require significantly more energy than those of wood, but metal can be recycled and melted for reused. Metal resources are not renewable, which means that the iron in the soil will not be replaced after it is mined.

Plastic is a commonly used material especially in task chair frames, castors, padding, fabrics, the edge strips of tables and cabinets and in the roller shutters of cabinets. Plastics are made from oil, which is a nonrenewable natural resource. The environmental impact of plastic results from the drilling and different treatment processes of oil and from the processing of plastic fibers. Processing plastics consumes great amounts of energy and chemicals. If well recycled, different plastics can be re-used. Most often though plastic is burned, in which case the energy content of the material can be utilized.

**Processes at Martela**

New product manufacturing processes, managed by Martela group, include the component production at Kidex Oy, most of the component operations of P.O. Korhonen and the operations of three logistics centers in Finland, Sweden and Poland. The operations of Kidex Oy mainly involve cutting chip board and MDF board, applying edge strips, laminating and veneer processes and surface finishing processes for veneered components. P.O. Korhonen produces form pressed components, CNC-machining, surface finishing and carries out the final assembly of certain products.

The logistics centers are responsible for the storage of components for products with a short delivery time and final assembly. Their operations are based on customer orders. The environmental effects of the logistics centers are created mainly by property related energy use, transportation of incoming and outgoing wares and the energy use of machinery. Surface finishing processes also add to the environmental impact of Kidex Oy and P.O. Korhonen. These processes use the more environmentally friendly, water-based surface finishing substances.

Since 2011 Martela has also been responsible for the refurbishment of second-hand products at the Outlet logistics center in Riihimäki. The environmental impact of the Outlet is similar to the other logistics centers. The raw materials used at the Outlet mainly consist of used furniture, which is repaired and re-sold, prolonging the life of the products.

**Martela products**

Martela products are designed to last over time and to answer customer needs. In the development phase, products are tested in various ways in Martela’s own test laboratory to ensure a long and functioning product life.

The production process, however, is only a small factor affecting the environmental impact of a product. If the product is used only for a short period of time and then discarded, it will have a greater effect on the environment than if it is maintained and used for decades and its materials recycled. Most of Martela's products do not consume energy, and even in electrically adjustable workstations energy consumption is minimal. Needed transportation, maintenance and repair can vary greatly from one product to another. For example, the upholstery of chairs will remain neat and intact significantly longer if they are vacuumed once a week and cleaned when dirty or at least once a year, as recommended. Dust and dirt will wear out the fabric. On the other hand, vacuuming and cleaning waste energy and chemicals, which also has an effect on the environment.

**The history of product environmental impact assessment at Martela**

In 1995 Martela took part in the Environmental Declaration project coordinated by VTT Technical Research Centre of Finland. The aim of the project was to research and document the environmental effects of wood-based products over the their product lifecycle and to summarize this information in customer-focused environmental reports. Through the project Martela was able to produce environmental reports for products in its Tangent-collection, namely a table, a cabinet and shelving system with roller shutter. Over time, PVC-materials have been removed from the products for environmental reasons, product structures have been changed and the supply chain modified. Even though the Tangent products are no longer in Martela's product program, the documents still provide a good overview of the environmental impact of the product categories.

Martela has also developed its own models for assessing environmental effects, which are applied in the product development phase. For customers, material descriptions and the material content of products are especially important information and these can be found in the environmental impact assessment reports. The reports have now been conducted for products in new product families. Two models have been used in the reports: one focuses on the energy content of the product's material content, the other provides an overview of the materials used in a product and their production processes.

Product lifecycle analysis in general began in the 1960s'. In 1969 Coca-Cola ordered the first environmental impact assessment for the energy consumption of drink packaging. The lifecycle analysis method was developed in the mid-1980s', as companies and consumers became more concerned with environmental issues. The environmental impact assessment of products has developed fast in the recent years, though standardization is still underway. In 2010 Martela ordered a lifecycle analysis of its products from Aalto University with the aim of developing a carbon footprint study. The products chosen were two different chairs: one made almost entirely of wood and the other with metal legs.

The study was done in the form of a Master's thesis and it examined the lifecycle of the products from the production of materials to final assembly. The lifecycle analysis was done over a six-month period and the result included the carbon footprint calculations of three product versions. According to the study, the carbon footprint of the Picco 316 chair with a powder coated base is 32,8 kgCO2-eq and 25,2 kgCO2-eq if the base is chromed. The carbon footprint of the wood-based Kari 3 chair is 6,3 kgCO2-eq. When evaluating the results one must take into consideration that study contains only the raw material and component manufacturing to finals assembly e.g. product until the factory gate. The information was collected on-site, using databases and literature and the carbon footprint calculation itself was conducted using the GaBi 4-program.

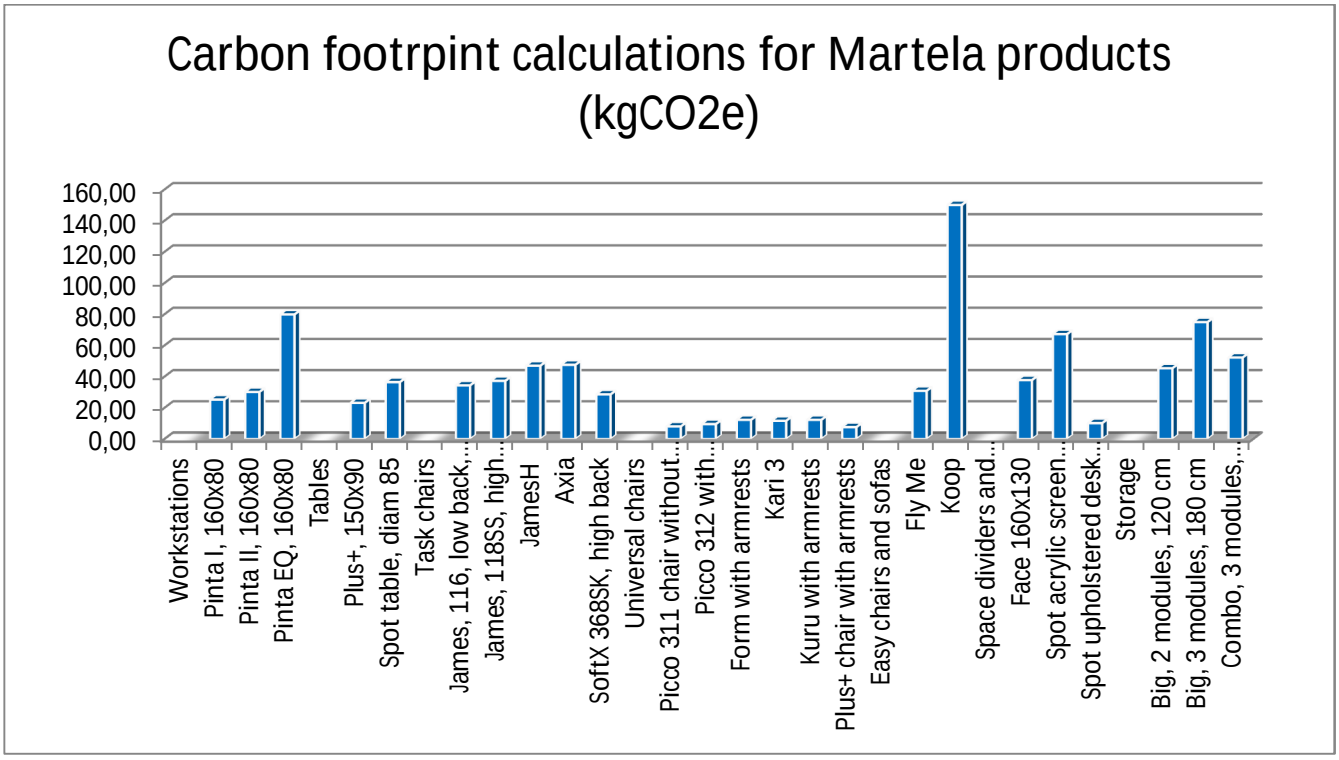
**From product-based calculations to product groups**

Inspired by the results of the carbon footprint research, Martela began searching for opportunities for conducting similar calculations for a broader selection of products. The goal was to conduct a carbon footprint assessment for several product groups using the same resources needed for one lifecycle analysis.

The chosen method focused on product groups. The method utilized the process information of repeated operations commonly used in manufacturing, which were then allocated to several products. The method enables the rapid calculation many products and it reacts quickly to changes in the production chain or processes. The first part of the carbon footprint calculation was to take into account materials, production, assembly, packaging materials and logistics. In the following stages the aim is to make the calculation more process-based without jeopardizing the comparability of the results.

As the study of environmental issues has been conducted over a long period of time, information must be gathered from numerous sources. Data concerning the energy consumption of different production processes can be found from the environmental and responsibility reports of the Product development department. The environmental effects of material, component and final product transportation on average as well as packaging materials have also been considered in the calculations.

The enormous amount of data was grouped into components and the information entered into the Footprinter-program. As all products have been calculated using the same method, the environmental impacts of Martela products can be compared with each other.




| | **kg$CO_2$e** | | **kg$CO_2$e** |
|---|---|---|---|
| **Workstations** | | **Universal chairs** | |
| Pinta I, 160x80 | **25,20** | Picco 311 chair without armrests | **7,96** |
| Pinta II, 160x80 | **30,10** | Picco 312 with armrests, upholstered | **9,48** |
| Pinta EQ, 160x80 | **79,80** | Form with armrests | **12,20** |
| **Tables** | | Kari 3 | **11,59** |
| Plus+, 150x90 | **23,10** | Kuru with armrests | **12,20** |
| Spot table, diam 85 | **36,40** | Plus+ chair with armrests | **7,52** |
| **Task chairs** | | **Space dividers and screens** | |
| James, 116, low back, with armrests | **34,30** | Face 160x130 | **37,70** |
| James, 118SS, high back, with armrests and seat slide | **37,20** | Spot acrylic screen with castor base | **67,20** |
| JamesH | **46,90** | Spot upholstered desk screen | **10,10** |
| Axia | **47,50** | **Storage** | |
| SoftX 368SK, high back | **28,50** | Big, 2 modules, 120 cm | **45,30** |
| **Easy chairs and sofas** | | Big, 3 modules, 180 cm | **74,90** |
| Fly Me | **30,80** | Combo, 3 modules, 120 cm, with sliding doors | **52,20** |
| Koop | **150,00** | | |