

Environmental Product Declaration

Tristan Chairs



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Market Coverage | Worldwide

 **EPD**[®]
TURKEY

ENVIRONMENTAL PRODUCT DECLARATIONS

KOLEKSİYON

In accordance with ISO14025 for Tristan Chairs



The visual of the product may not be compatible with the product information which is registered.

The environmental impacts of this product have been assessed from cradle to grave.
Environmental Product Declaration has been verified by an independent third party.

For more information about this Environmental Product Declaration or its content,
please contact internationalsales@koleksiyon.com.tr

Information

The LCA for this EPD is conducted according to the guidelines of ISO 14040/44 and the requirements given in the Product Category Rules (PCR) document for Seats, (ver. 2.0, 2015 11 03) and the general program guidelines by The International EPD System in accordance with ISO 14025 standards.

The inventory for the LCA study is based on the 2017 production figures for Tristan Chairs manufactured by Koleksiyon Mobilya San. A.Ş. (Koleksiyon) in their production plants located in Tekirdağ, Turkey.

This LCA was modelled with SimaPro 9 LCA software using the impact factors and Ecoinvent database (ver. 3.5) for secondary data and Turkish Life Cycle Inventory Database - TLCID (ver.1.0) developed by Turkish Centre for Sustainable Production Research and Design - SÜRATAM for local data in Turkey.

EPD PROGRAMM	The International EPD® System www.environdec.com EPD Turkey, Istanbul - Turkey www.epdturkey.org
EPD OWNER	KOLEKSİYON MOBİLYA SANAYİ A.S Istanbul - Turkey www.koleksiyon.com.tr www.koleksiyoninternational.com
DECLARED UNIT	One unit of furniture
EPD BASED ON PRODUCT CATEGORY RULES (PCR)	PCR 2009:02 Seats, ver. 2.0, 2015-11-03 The International EPD® System
PCR REVIEW CONDUCTED BY	Technical Committee of the International EPD® System Review chair: Leo Breedveld www.environdec.com info@environdec.com
INDEPENDENT VERIFICATION AND DATA, ACCORDING TO ISO 14025:2006	<input type="checkbox"/> Internal <input type="checkbox"/> External <input checked="" type="checkbox"/> EPD® Process Certification
SYSTEM BOUNDARIES	<input type="checkbox"/> Cradle to Gate <input type="checkbox"/> Cradle to Gate with Option <input checked="" type="checkbox"/> Cradle to Grave
APPROVED AND VERIFIED BY	Certiquality S.r.l. www.certiquality.com
LCA REPORT AND EPD PREPARED BY	Metsims Sustainability Consulting www.metsims.com

EPDs within the same product category but from different programmes may not be comparable.

Company

Competitive in the global marketplace, Koleksiyon holds to global standards and has internalized the protection principles of natural resources, the environment and the provision of healthy and safe environments for all his employees, partners in all business processes.

The company continuously improves his processes with the integrated management system to ensure the fair balance between efficiency, productivity and safety.

Koleksiyon puts emphasis on internal waste management and facilitating a high level of recycling in all processes with a commitment to continuous improvement.

Using technology, environmentally friendly and recyclable materials when designing products and services, Koleksiyon always aims at protecting the environment as well as human safety. The brand is also willing to ensure that each employee truly knows the importance of his/her contribution towards the green and sustainable environment.

Koleksiyon has a recognized reputation for delivering design and service excellence both in its homeland of Turkey and around the world. The brand is known for its clean and understated intelligent design, for its quality of manufacture and for its insight into the needs and concerns of customers.

Based on its key guiding principles and forty years' experience Koleksiyon designs are based on a profound knowledge of culture, history and geography. Its solutions reclaim the past that we know with colors, sounds and shapes. At the same time, Koleksiyon product designs anticipate the future we do not yet know. The aim is always to pursue excellence and to hold true to certain values. Koleksiyon knows that there is always a line that runs from the past to the future, that as well as local cultures and ideals, there are eternal and universal values that we all share and that what is essential is understanding the art and craft as it is tied up in a particular time and place.

Koleksiyon is compliant to following international standards: ISO 14001 EMS, OHSAS 18001, ISO 9001 QMS, ISO 10002 QM-CS, ISO 50001 EnMS, ISO/IEC 27001 ISMS.

Product Information

Tristan, which stands out for its innovative style, was designed by Gerhard Reichert and Eckhard Hansen in 2000. Designed to meet the various needs of different work cultures, Tristan is a large family consisting of operational, manager, executive and visitor armchairs as well as meeting and seminar models. It gives a characteristic look to communal spaces in workplaces.

LIST OF MATERIALS FOR TRISTAN CHAIR



MATERIALS		CONTENTS (kg)
Main Body	Steel	5.60
	PU	1.95
Auxiliary Materials	PVC	1.62
	Steel	0.921
	Paint	0.030
Main or Auxiliary	Steel	1.44
	Textile	0.396
Fittings	Steel	0.175
	PVC	0.042
Packaging Materials	Corrugated Board	2.73
	PE	0.101

System Boundary

Upstream Process

Upstream processes include raw material extraction and production processes and manufacturing of auxiliary materials, chemicals and packaging materials.

Core Process

Core processes include transport of materials to the manufacturer and operations for manufacturing.

Manufacturing includes sizing and painting of product parts and assembly. The end products are then packaged to be sold. Electric energy and natural gas are consumed during manufacturing.

Downstream Processes

Downstream processes include transportation from manufacturer to consumer, product use and disposal of both product and packaging.

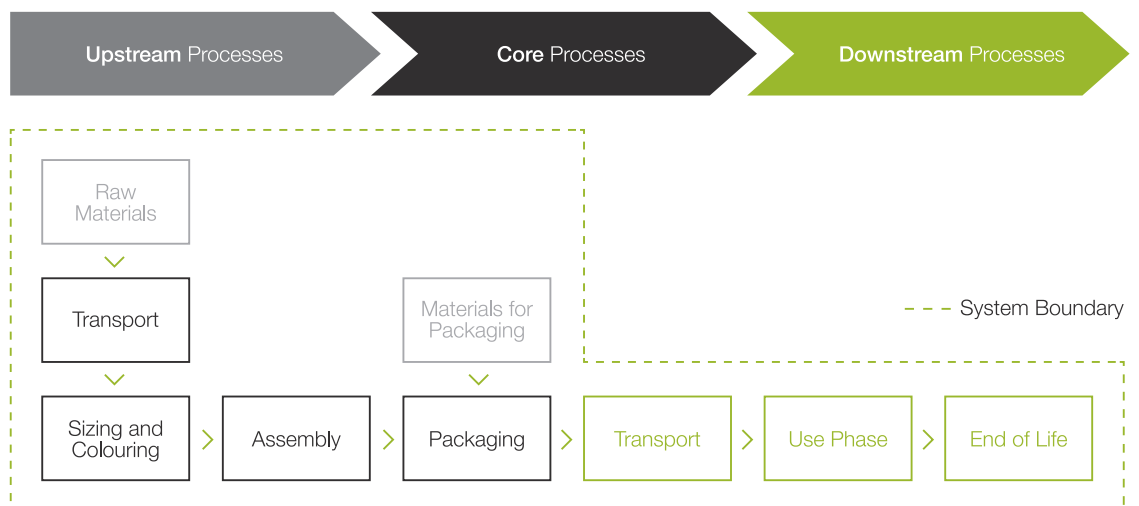
Distribution of final product to customer is assumed to be a default long distance transport of 1000 km by lorry defined by the PCR.

During use phase of the product, no energy or water is consumed. The product can be cleaned with a dry or damp cloth and do not require maintenance during its lifetime.

At the end of its life, it is expected from customers to dispose the product in accordance with the legal regulations of the country where they reside. The product is easy to disassemble and recycle. For the disposal scenario of the product European average recycling values were taken for steel, aluminium and plastic parts as 83%, 90% and 69.2% respectively. Other materials assumed to end up at landfill.

Packaging waste is assumed to end up at packaging recycling streams due to the relevant national law in Turkey in 2017, which requires manufacturers to have certain percentage of their packaging waste to be recovered.

SYSTEM BOUNDARY OF THE LCA STUDY CONDUCTED



Environmental Performance Related Information

FUNCTIONAL UNIT / DECLARED UNIT	The declared unit is the production of one unit of furniture with a minimum 15 years lifetime.
GOAL AND SCOPE	This EPD evaluates the environmental impacts of one unit of furniture from cradle to grave life cycle perspective.
SYSTEM BOUNDARY	The system boundary covers upstream, core and downstream processes within the life cycle.
ESTIMATES AND ASSUMPTIONS	<p>There are no additional product scenarios developed for this EPD.</p> <p>Distribution of final product to customer is assumed to be 1000 km by lorry.</p> <p>During use phase of the product, no energy or water consumption is assumed.</p> <p>At the end of its life, it was assumed that the metal parts of the product were recycled according to the European average recycling rates and the rest of the materials end up at landfill.</p> <p>Packaging waste for declared products are modelled based on the collection rates enforced by Packaging Waste Control Regulations of 27.12.2017 and No. 30283.</p>
CUT-OFF RULES	For this LCA study, no cut off criteria was applied.
BACKGROUND DATA	TLCID, ver 1.0, Turkey. Ecoinvent, ver. 3.5, Switzerland
DATA QUALITY	Raw materials, electricity, natural gas, water use and waste data collected from Koleksiyon. Localized data especially on energy and other relevant processes were taken from TLCID Database.
PERIOD UNDER REVIEW	All primary data collected from Koleksiyon plant is for the period year of 2017.
ALLOCATIONS	There are no co-products in the production of Tristan Chairs manufactured by Koleksiyon. Hence, there was no need for co-product allocation. Use of energy per unit of furniture is allocated based on the time spent in the manufacturing line from yearly energy consumption of each workshop. Koleksiyon sources raw materials and goods from different locations across Turkey and other parts of the world and by different means of transport (truck, ship and train). For this reason, transport was allocated according to tonnages.

All the waste resulting from the main production and related processes of Koleksiyon is managed in accordance with valid legal requirements.

Global warming potential (GWP) for time span of 100 years, acidification potential with time span of eternity and eutrophication potential with time span of eternity were calculated using CML-IA baseline (August 2016, ver. 4.7),

Formation potential of tropospheric ozone photochemical oxidants with time span of 5 days was calculated using ReCiPe 2008 Midpoint (H) (ver. 1.13),

Renewable and non-renewable energy consumption were calculated using Cumulative Energy Demand (November 2018, ver. 1.11),

Human toxicity (cancer and non-cancer) and ecotoxicity were calculated using USEtox 2 (recommended + interim), July 2016, ver. 1.00),

Land use as sum of agricultural land occupation, urban land occupation and natural land transformation was calculated using ReCiPe 2016 Endpoint (H) (ver. 1.03, September 2018)

Water scarcity potential was calculated using AWARE (ver. 1.02).

All resource use values are determined from life cycle inventory of products as renewable and non-renewable resources. The direct amount of water used by core processes reflects the net fresh water consumption during manufacturing for the declared product.

ENVIRONMENTAL INDICATORS

RESOURCE USE						
Parameter	Unit	Upstream Processes	Core Processes	Downstream Processes	Total	
NON-RENEWABLE RESOURCES						
Material	Calcite	[kg]	4.22	0.044	0.049	4.31
	Bauxite	[kg]	0.491	0.003	0.010	0.504
	Dolomite	[kg]	0.219	306x10 ⁻⁶	0.001	0.220
	Gravel	[kg]	9.43	0.569	2.22	12.2
	Iron	[kg]	9.92	0.012	0.067	10.00
	Sodium Chloride	[kg]	3.82	0.002	0.002	3.82
Energy	Hard Coal	[kg]	14.7	0.976	0.150	15.8
	Lignite	[kg]	4.06	1.51	0.043	5.61
	Oil, crude	[kg]	5.10	0.933	0.966	7.00
	Natural gas	[m ³]	6.73	1.51	0.078	8.31
	Uranium	[MJ]	192x10 ⁻⁶	1.99x10 ⁻⁶	1.69x10 ⁻⁶	195x10 ⁻⁶
RENEWABLE RESOURCES						
Material	Wood	[m ³]	0.003	12.8x10 ⁻⁶	18.1x10 ⁻⁶	0.003
	Geothermal	[MJ]	0.837	1.27	0.009	2.12
Energy	Wind power	[MJ]	5.81	2.05	0.064	7.93
	Hydropower	[MJ]	50.9	6.68	0.345	57.9
	Biomass	[MJ]	59.5	0.151	0.213	59.8
	Solar	[MJ]	0.677	0.322	0.005	1.00
WATER USE						
Total amount of water	[m ³]	1.28	0.024	0.008	1.31	
Direct amount of water used by the core process	[m ³]	-	0.000	-	0.000	

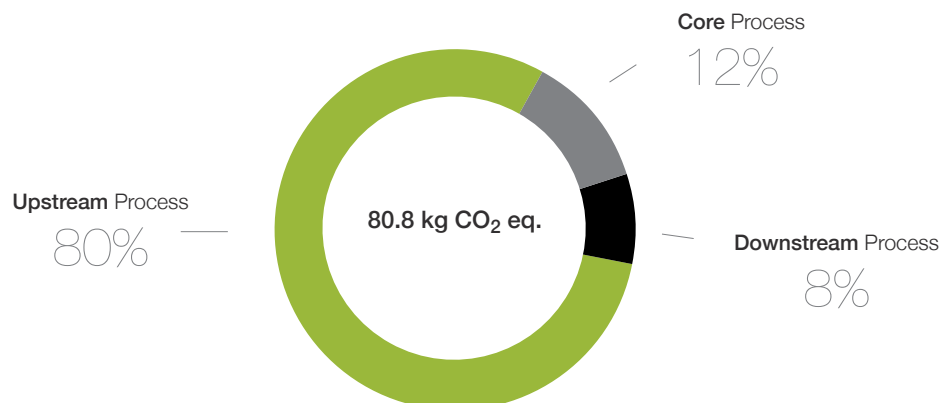
WASTE CATEGORIES					
Parameter	Unit	Upstream Processes	Core Processes	Downstream Processes	Total
HWD	[kg]	-	0.085	0	0.085
NHWD	[kg]	-	0.316	17.5	17.8
RWD	[kg]	-	0	0	0

Legend HWD: Hazardous Waste Disposed, NHWD: Non-Hazardous Waste Disposed, RWD: Radioactive Waste Disposed

OUTPUT FLOWS					
Parameter	Unit	Upstream Processes	Core Processes	Downstream Processes	Total
Components for reuse	[kg]	0	0	0	0
Material for recycling	[kg]	0	0	0	0
Materials for energy recovery	[kg]	0	0	0	0
Exported energy, electricity	[MJ]	0	0	0	0
Exported energy, thermal	[MJ]	0	0	0	0

ENVIRONMENTAL IMPACTS					
Parameter	Unit	Upstream Processes	Core Processes	Downstream Processes	Total
GWP, Fossil	kg CO ₂ eq.	64.2	9.49	3.46	77.2
GWP, Biogenic	kg CO ₂ eq.	0.716	0.009	2.70	3.43
GWP, Land use and land transformation	kg CO ₂ eq.	0.144	0.044	0.001	0.189
GWP TOTAL	kg CO ₂ eq.	65.1	9.54	6.16	80.8
AP (fate not incl.)	kg SO ₂ eq.	0.285	0.038	0.009	0.332
EP	kg PO ₄ eq.	0.135	0.017	0.034	0.186
POCP	kg NMVOC eq.	0.235	0.028	0.008	0.272
ADPE	kg Sb eq.	516x10 ⁻⁶	1.40x10 ⁻⁶	11.8x10 ⁻⁶	529x10 ⁻⁶
ADPF	MJ	760	124	47.6	931
Water scarcity potential	m ³	65.4	2.21	0.261	67.9
Human toxicity, cancer	cases	14.7x10 ⁻⁶	388x10 ⁻⁹	168x10 ⁻⁹	15.2x10 ⁻⁶
Human toxicity, non-cancer	cases	22.9x10 ⁻⁶	971x10 ⁻⁹	2.45x10 ⁻⁶	26.3x10 ⁻⁶
Freshwater ecotoxicity	PAF.m ³ .day	582x10 ⁺³	44.1x10 ⁺³	104x10 ⁺³	730x10 ⁺³
Land use	species.yr	52.9x10 ⁻⁹	394x10 ⁻¹²	1.00x10 ⁻⁹	54.3x10 ⁻⁹

Legend **GWP:** Global Warming Potential, **AP:** Acidification Potential, **POCP:** Formation Potential of Tropospheric Ozone Photochemical Oxidants
EP: Eutrophication Potential, **HT:** Human Toxicity



References

ISO 14001

Environmental Management Systems

OHSAS 18001

Occupational Health and Safety Management

ISO 9001

Quality Management System

ISO 14025

DIN EN ISO 14025:2009-11: Environmental labels and declarations - Type III environmental declarations - Principles and procedures

ISO 14040/44

DIN EN ISO 14040:2006-10, Environmental management - Life cycle assessment - Principles and framework (ISO 14040:2006) and Requirements and guidelines (ISO 14044:2006)

PCR FOR SEATS

Prepared by IVL Swedish Environmental Research Institute, Swedish Environmental Protection Agency, SP Trä, Swedish Wood Preservation Institute, Swedisol, SCDA, Svenskt Limträ AB, SSAB, The International EPD System, ver. 2.0, Date 2015 11 03

THE INTERNATIONAL EPD® SYSTEM

The International EPD® System is a programme for type III environmental declarations, maintaining a system to verify and register EPD®s as well as keeping a library of EPD®s and PCRs in accordance with ISO 14025 .www.environdec.com

ECOINVENT

Ecoinvent Centre, www.Eco-invent.org

SIMAPRO

SimaPro LCA Software, Pré Consultants, the Netherlands,
www.pre-sustainability.com

TLCID

Turkish Life Cycle Inventory Database, Turkish Centre for Sustainable Production Research and Design - SÜRATAM
www.suratam.org





RECYCLING RATES

Steel: Post consumer steel product recovery rate by sector, weighted global average, World Steel Association, Sustainable Steel, At the core of a green economy, 2012.

Aluminium: Aluminium Recycling in Europe, European Aluminium Association and Organisation of Aluminium Refiners and Remelters, 2006.

Plastic: Plastics – the Facts 2016, An analysisi of European plastics production, demand and waste data, Plastics Europe, 2016.

Verification & Registration

PROGRAMME	The International EPD® System www.environdec.com	
PROGRAMME OPERATOR	EPD registered through the fully aligned regional programme: EPD Turkey www.epdturkey.org	
THIRD PARTY VERIFIER	EPD International AB Box 210 60 SE-100 31 Stockholm, Sweden	
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