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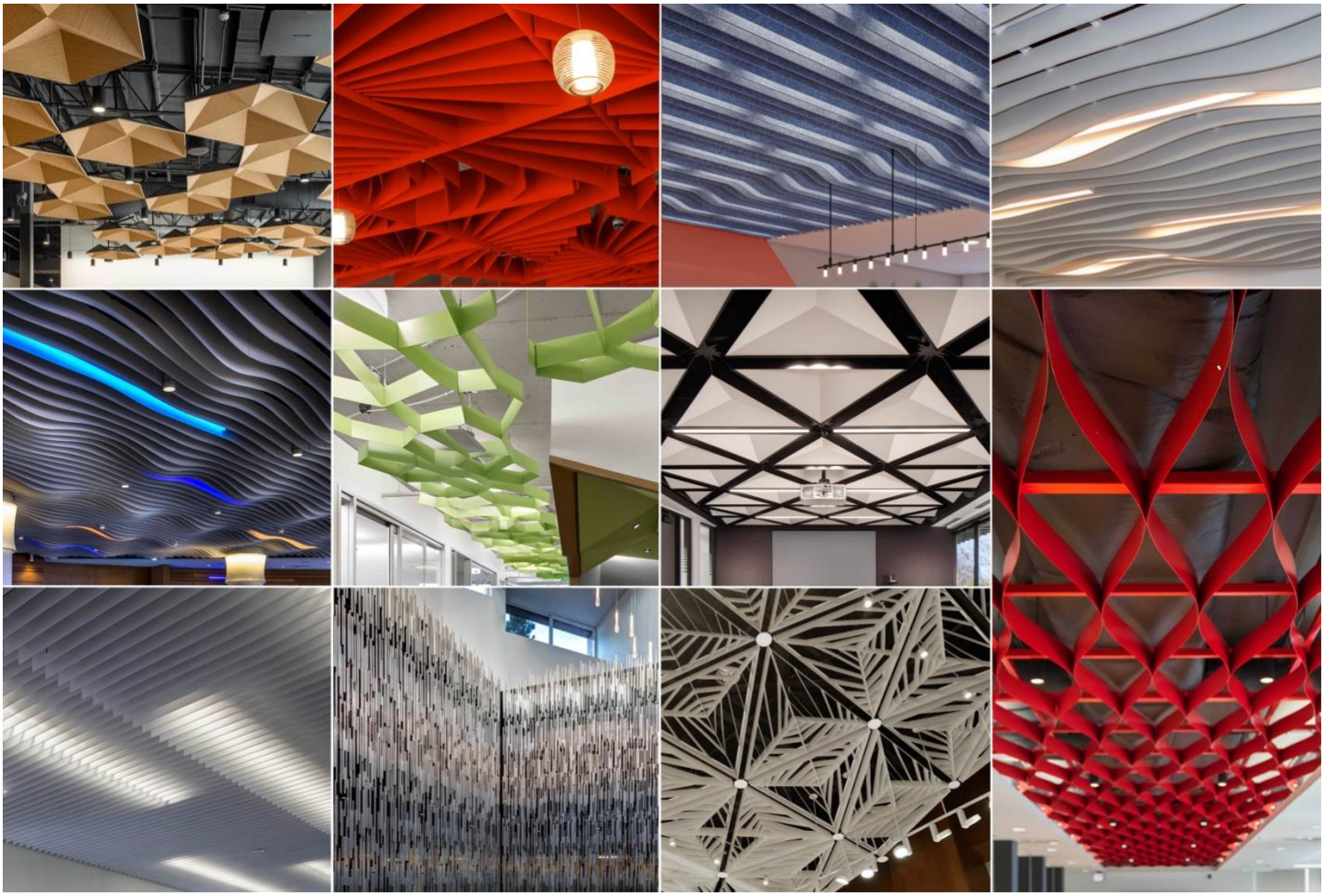


Atmosphera®, Secare®, SoundStar®, TriSoft®

Steel Ceiling and Interior Wall Panels

Environmental Product Declaration

Date of Issue: 08/14/2023
Date of Expiration: 08/14/2028

PRODUCT CATEGORY RULE
UL Part A: Life Cycle Assessment Calculation Rules and Report Requirements, UL 10010, V3.2
UL Part B: Metal Ceiling and Interior Wall Panel System EPD Requirements, UL 10010-12, V1.0.

DECLARED UNIT
1 m^2 panel

ASTM INTERNATIONAL

Program Operator	ASTM International 100 Barr Harbor Dr., West Conshohocken, PA 19428 cert@astm.org
General Program Instructions and Version Number	ASTM Program Operator Rules. Version: 8.0, Revised 04/29/20
Manufacturer Name and Address	Arktura LLC 18225 South Figueroa Street, Los Angeles, CA 90248 info@arktura.com
Declaration Number	ASTM-EPD541
Declared Product and Functional Unit	Steel Ceiling and Interior Wall Panels Declared Unit: 1 m^2 of panel (alternative unit of 1 ft^2 also declared)
Reference PCR and Version Number	ISO 21930:2017 UL Part A: Part A: Life Cycle Assessment Calculation Rules and Report Requirements, UL 10010, V3.2. UL Part B: Metal Ceiling and Interior Wall Panel System EPD Requirements, , v1.0
Product's intended Application and Use	Commercial
Intended Audience	Business-to-Business
Product RSL	n/a
Markets of Applicability	North America
Date of Issue	08/14/2023
Period of Validity	5 years from date of issue
EPD Type	Manufacturer Specific
EPD Scope	Cradle-to-Gate (A1 to A3 modules)
Year of reported manufacturer primary data	2021
LCA Software and Version Number	GaBi 10.7
LCI Database and Version Number	GaBi Database 2022.2
LCIA Methodology and Version Number	TRACI 2.1 + IPCC AR5

LCIA Results Overview per 1ft^2 (A1 to A3 modules)

	Atmosphera® Group 1	Atmosphera® Group 2	Secare®	SoundStar® Group 1	SoundStar® Group 2
GWP [kg CO_2 eq]	2.14	3.56	16.98	7.58	7.55
ODP [kg CFC 11 eq]	2.99E-11	2.99E-11	1.98E-13	2.07E-12	1.84E-12
AP [kg SO_2 eq]	6.93E-03	1.09E-02	8.55E-02	2.75E-02	2.77E-02
EP [kg N eq]	7.47E-04	1.16E-03	5.02E-03	2.40E-03	2.52E-03
SFP [kg O_3 eq]	8.71E-02	1.47E-01	1.10E+00	3.58E-01	3.69E-01
Resources [MJ]	2.15E+00	3.86E+00	1.53E+01	8.06E+00	8.28E+00

The sub-category PCR review was conducted by:	Jack Geibig, P.E. (Chair) Philip S. Moser, P.E. Kristen Rowe, MEM
Independent verification of the declaration and data, according to ISO 21930:2017, UL Part A, ISO 14025:2006, and UL Part B sub-category. **☐ Internal ☒ External**	Tim Brooke, ASTM International
This life cycle assessment was conducted in accordance with ISO 14044 and the reference PCR by:	WAP Sustainability Consulting
This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by:	Lindita Bushi, Ph.D., Athena Sustainable Materials Institute

Limitations:

- Environmental declarations from different programs (ISO 14025) may not be comparable.
- Comparison of the environmental performance of Metal Ceiling and Wall System Products using EPD information shall be based on the product's use and impacts at the building level, and therefore EPDs may not be used for comparability purposes when not considering the building energy use phase as instructed under this PCR.
- Full conformance with this PCR allows EPD comparability only when all stages of a life cycle have been considered. However, variations and deviations are possible". Example of variations: Different LCA software and background LCI datasets may lead to differences results for upstream or downstream of the life cycle stages declared.

General Information

Company Description

At Arktura, we make design happen. For over a decade, Arktura has been at the forefront of architectural design and fabrication, delivering groundbreaking, award-winning products and custom projects, working in collaboration with architects and interior designers around the world.

Our architectural systems are devised with flexibility in mind, combining powerful design variables that allow each product to be tailored to a wide range of environments. Our growing line of offerings, including acoustic solutions, ceiling clouds and baffles, interior and exterior panel systems, and building façades set new standards across the A+D community in terms of design aesthetic, adaptability and product quality.

Each of our standardized products is an easy-to-use, highly flexible “tool set.” From overall configuration right down to attachment points, perforations, patterns, and finishes, the variables designed into each core product set can be adjusted to meet your requirements. Explore our products library to see the results—visual impact, simple refinement, and ease of installation.

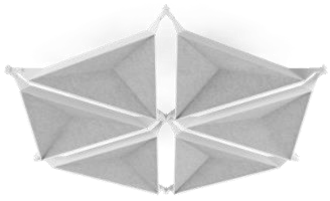
All products are manufactured at Arktura’s Los Angeles factory.

Product Descriptions

Atmosphera® systems showcase the pinnacle of Arktura's innovative design and manufacturing capabilities. With a versatile family of modular ceiling systems, Atmosphera® presents options that are dynamic, scalable, and affordable. Choose from a spectrum of designs that cater to your aesthetic preferences, be it linear, organic, or faceted, and enjoy the wide range of colors available. Immerse your spaces in a unique visual experience that breathes life into any environment.
CSI: 05 70 00, 09 50 00, 09 54 05; UNSPSC: 30161602

Assembled from precision-cut tubes, **Secare®** panels add a textural and dimensional impact to any project. The choice of round or square tubing, the luxurious aesthetic of the brushed stainless steel, and the variety of the powder coated options combine to create a versatile product range. Each preassembled module is designed to respond dynamically to the needs of your space.
CSI: 05 70 00, 07 42 13, 09 78 13; UNSPSC: 30161602

The **SoundStar®** ceiling system’s hexagonally shaped cellular clouds offer a scalable way to add geometric dimensionality and disrupt sound’s ability to travel across a space. Its design incorporates angled surfaces made from our Soft Sound® acoustical material to dampen noise in every direction. Thanks to its flexible, modular configuration, SoundStar® can quilckly be installed and adapt to a range of spaces and design visions.
CSI: 05 70 00, 09 50 00, 09 54 05; UNSPSC: 30161602



TriSoft® ceiling system makes it easy to add faceted dimensionality and quiet elegance to interiors. Its triangular faceted pyramid faces are composed of our Soft Sound® acoustical material with a metal substructure. Mix and match TriSoft’s® available modules and nodes as building blocks to build faceted straight field layouts scalable to any size space. With a variety of color options, and specially

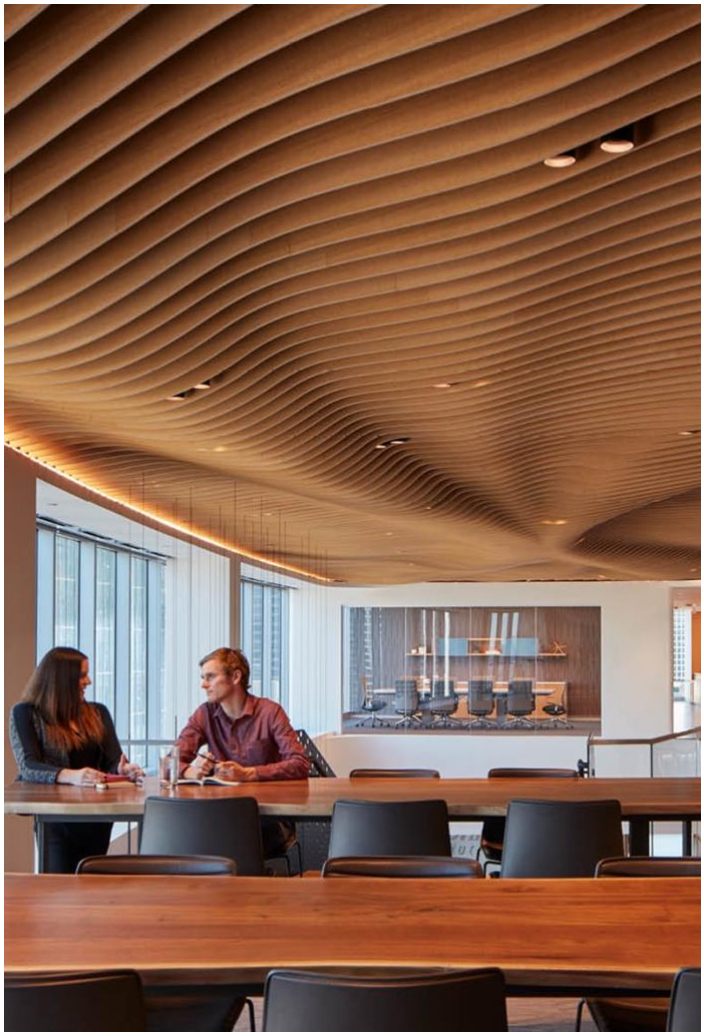
engineered attachment brackets, TriSoft® is designed for maximum impact, flexibility, convenience, and acoustic performance.
CSI: 05 70 00, 09 50 00, 09 54 05; UNSPSC: 30161602

All products are intended for use in an interior, commercial setting.

Product Average
Product averages were developed to encompass all products that fall within +/-10% for all environmental impact indicators, excluding ODP. This was done by by first grouping based on the mass of raw material and packaging, evaluated for each material. Further refinement was done by running LCA results for each first round grouping and combining results that were similar.

Table 1: Product groupings

Atmosphera® Group 1	Atmosphera® Fiora
	Atmosphera® Lotus
	Atmosphera® Pulse
	Atmosphera® Ripple
Atmosphera® Group 2	Atmosphera® Analog
	Atmosphera® Analog 3D
	Atmosphera® Contour
	Atmosphera® Contour 3D
	Atmosphera® Flow
	Atmosphera® Linea
	Atmosphera® Rise
	Atmosphera® Strata
	Atmosphera® Surf
	Atmosphera® Swell
	Atmosphera® Versa
	Atmosphera® Versa 3D
Secare®	Secare®
SoundStar® Group 1	SoundStar® 12
	Trisoft® Half Module
SoundStar® Group 2	SoundStar® 24
	Trisoft® Full Module



Product Composition

No substances required to be reported, per RCRA, Subtitle 3, as hazardous are associated with the production of this product.

Table 2: Product compositions

Mass %	Recycled Content %	Atmosphera® Group 1	Atmosphera® Group 2	Secare®	SoundStar® Group 1	SoundStar® Group 2
Steel Sheets	22%	99.1%	75.9%	44.6%	76.4%	74.5%
Soft Sound® (PET)	60%	-	19.5%	-	17.0%	17.5%
Stainless Steel Sheets	23%	-	-	55.4%	-	-
Aluminium Sheets	25%	-	-	-	4.4%	5.7%
Other	Varies	0.9%	4.6%	-	2.2%	2.2%

Technical Requirements

Table 3: Technical requirements

Name and Standard	Unit	Atmosphera® Group 1	Atmosphera® Group 2	Secare®	SoundStar® Group 1	SoundStar® Group 2
Sound absorption coefficient (ASTM C423)	%	Not Relevant	.35-1.5	Not Relevant	.75-.85	.75-.95
Standard specs for metal suspension systems (ASTM C635)	Pass/Fail	Not Relevant	Not Relevant	Not Relevant	Not Relevant	Not Relevant
Standard test methods for surface burning characteristics of building materials (ASTM E84)	Flame spread/smoke developed	Class A	Class A	Class A	Class A	Class A

LCA Methodology

Declared Unit

Table 4: Declared unit details

		Atmosphera® Group 1	Atmosphera® Group 2	Secare®	SoundStar® Group 1	SoundStar® Group 2
Declared unit	m^2	1	1	1	1	1
Weight	kg	7.17	12.4	36.9	17.3	16.5
Conversion to 1 kg	-	0.14	0.0807	0.0271	0.0577	0.0605
Alternate declared unit	ft^2	1	1	1	1	1
Alternate declared unit weight	lb	1.47	2.54	7.56	3.55	3.38
Thickness, average [Range]	cm	19.7 [12.7-40.6]	26.2 [12.7-40.6]	10.6 [8.89-12.4]	30.8	59.7
Alternate thickness, average [Range]	in	7.75 [5.0-16.0]	10.3 [5.0-16.0]	4.19 [3.5-4.875]	12.1	23.5

System Boundary

Table 5. Description of the system boundary modules

Production			Construction		Use							End of Life				Benefits & Loads Beyond System Boundary
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Raw Material Supply	Transport	Manufacturing	Transport to Site	Assembly/Install	Use	Maintenance	Repair	Replacement	Refurbishment	Operational Energy Use	Operational Water Use	Deconstruction	Transport	Waste Processing	Disposal	Reuse, Recovery, Recycling Potential
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

*MND = not declared

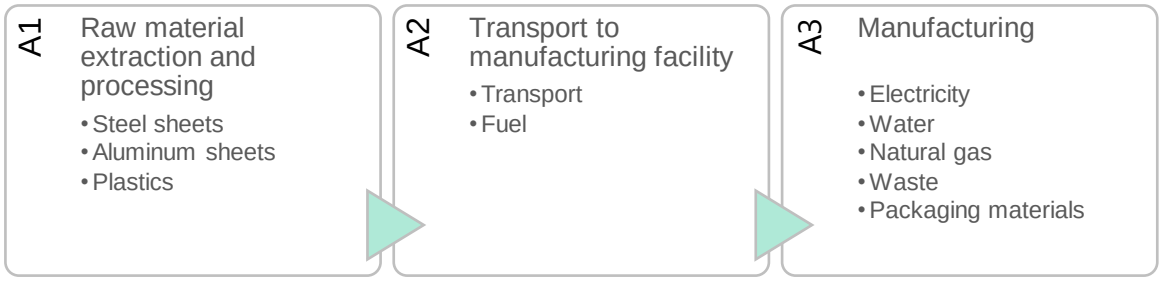


Figure 1: System boundary diagram

Note that hanger wires, molding, and/or attachment/hold down clips are excluded from the system boundary.

Allocation

General principles of allocation were based on ISO 14040/44. To derive a per-unit value for manufacturing inputs such as electricity, thermal energy and water, allocation based on total production by area was adopted, as this is the basis on which products are processed and sold, regardless of product weight. As a default, secondary GaBi datasets use a physical basis for allocation.

Cut-off Rules

Material inputs greater than 1% (based on total mass of the final product) were included within the scope of analysis. Material inputs less than 1% were included if sufficient data was available to warrant inclusion and/or the material input was thought to have significant environmental impact. Cumulative excluded material inputs and environmental impacts are less than 5% based on total weight of the functional unit. No known flows are deliberately excluded from this EPD.

Period Under Review

Data were obtained from Arktura for calendar year 2021.

Technical Information and Scenarios

Manufacturing

Arktura's Atmosphera®, Secare®, SoundStar®, and Trisoft® ceilings are manufactured primarily from a combination of sheet metal, and up to 60% recycled PET (Polyethylene) acoustical boards. Metal sheets are cut, labeled, and bent into shape for the structural or framing components. These metal components are powder coated and assembled together with the PET acoustical boards which are labeled and cut to shape. The products are packaged and then shipped and installed. In the case of Atmosphera® systems, the components are shipped flat-packed and assembled onsite.

Packaging

Packaging requirements are presented in Table 5, per functional unit. Often, a large amount of packaging may be needed to ensure the shape of the product does not get damaged during transit, as is the case with SoundStar.

Table 6: Packaging per m^2

kg/m^2	Atmosphera® Group 1	Atmosphera® Group 2	Secare®	SoundStar® Group 1	SoundStar® Group 2
Packaging Lumber	0.63	0.63	11.26	8.64	9.98
Packaging Plywood	0.44	0.44	19.29	5.50	7.27
Packaging Aluminium				0.54	0.54
Packaging Polystyrene	0.20	0.20	0.61	0.11	0.11
Packaging LDPE Foam				0.06	0.06
Packaging LDPE Film	0.04	0.04			
Packaging Cardboard	0.005	0.005			

Results

Environmental impacts were calculated using the GaBi software platform. Impact results have been calculated using IPCC AR5 and TRACI 2.1 characterization factors. Results presented in this report are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins, or risks.

Acronym [Unit]	**Environmental Indicators**	**Methodology**
GWP [kg CO_2 eq]	Global Warming Potential, excl biogenic carbon	IPCC AR5
ODP [kg CFC-11 eq]	Ozone Depletion Potential	TRACI 2.1
AP [kg SO_2 eq]	Acidification Potential	TRACI 2.1
EP [kg N eq]	Eutrophication Potential	TRACI 2.1
SFP [kg O_3 eq]	Smog Formation Potential	TRACI 2.1
Resources [MJ, Surplus Energy]	Resources, Fossil fuels [MJ surplus energy]	TRACI 2.1
Resource Use Indicators		
RPRE [MJ]	Use of renewable primary energy	
RPRM [MJ]	Renewable primary energy resources used as raw materials	
RPRT [MJ]	Total use of renewable primary energy resources	
NRPRE [MJ]	Use of non-renewable primary energy	
NRPRM [MJ]	Non-renewable primary energy resources used as raw materials	
NRPRT [MJ]	Total use of non-renewable primary energy resources	
SM [kg]	Input of secondary material	
RSF [MJ]	Use of renewable secondary fuels	
NRSF [MJ]	Use of non renewable secondary fuels	
RE [MJ]	Recovered energy	
FW [m^3]	Use of net fresh water	
Output Flows and Waste Categories		
HWD [kg]	Hazardous waste disposed	
NHWD [kg]	Non-hazardous waste disposed	
HLRW [kg]	High-level radioactive waste, conditioned, to final repository	
ILLRW [kg]	Intermediate- and low-level radioactive waste, conditioned, to final repository	
CRU [kg]	Components for re-use	
MR [kg]	Materials for Recycling	
MER [kg]	Material for Energy Recovery	
EEE [MJ]	Exported electrical energy	
EET [MJ]	Exported thermal energy	

LCA Results

Table 7: LCA Results, per 1 m^2 panels (A1 to A3)

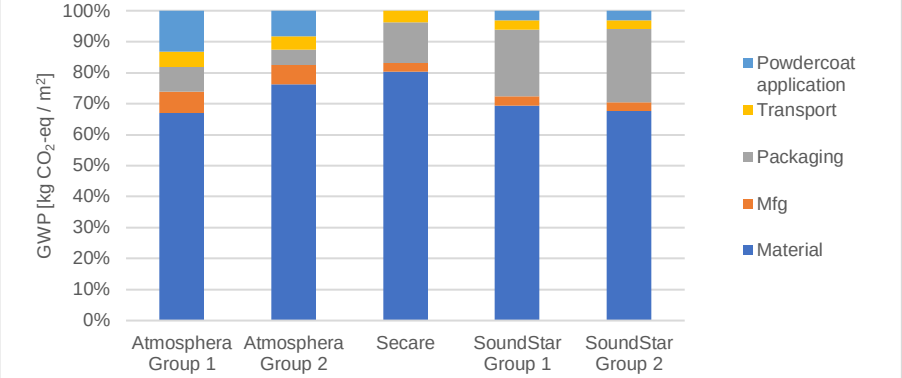
Impact Categories	Atmosphera® Group 1	Atmosphera® Group 2	Secare®	SoundStar® Group 1	SoundStar® Group 2
GWP [kg CO_2 eq]	23.0	38.3	183	81.6	81.3
ODP [kg CFC 11 eq]	3.22E-10	3.22E-10	2.14E-12	2.23E-11	1.98E-11
AP [kg SO_2 eq]	7.46E-02	1.17E-01	9.21E-01	2.96E-01	2.98E-01
EP [kg N eq]	8.04E-03	1.25E-02	5.41E-02	2.59E-02	2.71E-02
SFP [kg O_3 eq]	9.37E-01	1.58E+00	1.19E+01	3.86E+00	3.97E+00
Resources [MJ]	2.32E+01	4.16E+01	1.65E+02	8.68E+01	8.91E+01
Resource Use Indicators					
RPRE [MJ]	5.33E+01	7.01E+01	5.61E+02	4.29E+02	4.61E+02
RPRM [MJ]	1.84E+01	1.84E+01	5.44E+02	2.41E+02	2.95E+02
RPRT [MJ]	7.17E+01	8.84E+01	1.10E+03	6.70E+02	7.57E+02
NRPRE [MJ]	2.82E+02	4.40E+02	2.34E+03	9.87E+02	9.99E+02
NRPRM [MJ]	9.93E+00	6.68E+01	2.48E+01	6.09E+01	6.78E+01
NRPRT [MJ]	2.92E+02	5.07E+02	2.37E+03	1.05E+03	1.07E+03
SM [kg]	2.61E+00	5.31E+00	9.34E+00	6.88E+00	6.72E+00
RSF [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RE [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW [m^3]	1.20E-01	2.16E-01	1.57E+00	7.23E-01	7.00E-01
Output Flows and Waste Categories					
HWD [kg]	7.86E-06	1.29E-02	1.35E-02	1.22E-02	1.38E-02
NHWD [kg]	2.73E+00	4.74E+00	1.01E+01	1.35E+01	1.26E+01
HLRW [kg]	9.99E-06	1.50E-05	9.75E-05	4.34E-05	4.67E-05
ILLRW [kg]	8.55E-03	1.27E-02	7.55E-02	3.83E-02	4.11E-02
CRU [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MR [kg]	2.26E-01	4.04E-01	1.17E+00	5.47E-01	5.21E-01
MER [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE [MJ]	2.51E-01	4.48E-01	1.29E+00	6.07E-01	5.78E-01
EET [MJ]	1.18E-01	2.11E-01	6.08E-01	2.85E-01	2.72E-01

Table 8: LCA Results, per 1 ft² panels (A1 to A3)

Impact Categories	Atmosphera® Group 1	Atmosphera® Group 2	Secare®	SoundStar® Group 1	SoundStar® Group 2
GWP [kg CO_2 eq]	2.14	3.56	16.98	7.58	7.55
ODP [kg CFC 11 eq]	2.99E-11	2.99E-11	1.98E-13	2.07E-12	1.84E-12
AP [kg SO_2 eq]	6.93E-03	1.09E-02	8.55E-02	2.75E-02	2.77E-02
EP [kg N eq]	7.47E-04	1.16E-03	5.02E-03	2.40E-03	2.52E-03
SFP [kg O_3 eq]	8.71E-02	1.47E-01	1.10E+00	3.58E-01	3.69E-01
Resources [MJ]	2.15E+00	3.86E+00	1.53E+01	8.06E+00	8.28E+00
Resource Use Indicators					
RPRE [MJ]	4.95E+00	6.51E+00	5.21E+01	3.99E+01	4.29E+01
RPRM [MJ]	1.71E+00	1.71E+00	5.05E+01	2.23E+01	2.74E+01
RPRT [MJ]	6.66E+00	8.21E+00	1.03E+02	6.22E+01	7.03E+01
NRPRE [MJ]	2.62E+01	4.09E+01	2.18E+02	9.17E+01	9.28E+01
NRPRM [MJ]	9.23E-01	6.21E+00	2.30E+00	5.66E+00	6.30E+00
NRPRT [MJ]	2.72E+01	4.71E+01	2.20E+02	9.74E+01	9.91E+01
SM [kg]	2.42E-01	4.94E-01	8.68E-01	6.39E-01	6.24E-01
RSF [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RE [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW [m^3]	1.11E-02	2.01E-02	1.46E-01	6.72E-02	6.50E-02
Output Flows and Waste Categories					
HWD [kg]	7.30E-07	1.20E-03	1.25E-03	1.13E-03	1.28E-03
NHWD [kg]	2.54E-01	4.40E-01	9.42E-01	1.25E+00	1.17E+00
HLRW [kg]	9.28E-07	1.39E-06	9.06E-06	4.03E-06	4.34E-06
ILLRW [kg]	7.95E-04	1.18E-03	7.02E-03	3.56E-03	3.82E-03
CRU [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MR [kg]	2.10E-02	3.75E-02	1.08E-01	5.09E-02	4.84E-02
MER [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE [MJ]	2.33E-02	4.16E-02	1.20E-01	5.64E-02	5.37E-02
EET [MJ]	1.10E-02	1.96E-02	5.65E-02	2.65E-02	2.53E-02

Interpretation

A dominance analysis for Global Warming Potential was conducted for all products. Upstream raw material extraction and processing was found to be the largest contributor, followed by packaging. As manufacturing utilites were allocated on a per m^2 basis, products with overall lower impacts show a higher contribution from manufacturing.



Additional Environmental Information

Environment and Health During Manufacturing

Arktura prioritizes environmental sustainability, health, and safety throughout its manufacturing processes. From product design to waste reduction initiatives, Arktura integrates responsible practices to minimize environmental impact. The company is committed to ensuring a safe working environment for its employees and strives to optimize energy and water usage while promoting recycling and responsible disposal practices.

Environment and Health During Installation

All recommendations shall be utilized as indicated by SDS and installation guidelines. Specific product SDS and installation instructions can be requested directly from Arktura.

Environmental Activities and Certifications

Additional environmental certifications for Arktua's products such as Declare Labels, HPD, SDS, VOC Testing, acoustical performance and light reflectance can be requested directly from Arktura.

References

ASTM Program Operator Rules. Version: 8.0, Revised 04/29/20.

Life Cycle Assessment of Arktura Products: Background Report for EPD of Metal and Non-metal Ceiling and Interior Wall Panel Products. WAP Sustainability. May 2023.

ISO 14025:2006 Environmental labels and declarations – Type III environmental declarations – Principles and procedures.

ISO 14040:2006/Amd1:2020 Environmental management - Life cycle assessment – Principles and framework.

ISO 14044:2006/Amd1:2017/Amd2:2020 Environmental management - Life cycle assessment – Requirements and guidelines.

ISO 21930:2017 Sustainability in buildings and civil engineering works - Core rules for environmental product declarations of construction products and services. Geneva: International Organization for Standardization.

UL Environment. (2018). Part A: Life Cycle Assessment Calculation Rules and Report Requirements, UL 10010*, V3.2.*

UL Environment. (2020). *Part B: Metal Ceiling and Interior Wall Panel System EPD Requirements, UL 10010-12, V1.0.*