

Fan Coil Array Fan Coil Module

Nortek Data Center Cooling



Cooling the cloud. Protecting the planet.

Environmental Product Declaration

Declaration Number:	ASTM-EPD 1169
Date of Issue:	2026-04-14
Date of Expiration:	2031-04-14

Product Category Rule

ISO 21930:2017
In accordance with ISO 14025

Declared Unit

1 unit of product

General Information

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	Nortek Data Center Cooling Solutions 12701 N. Sante Fe, Building 500 Oklahoma City, OK 73114 https://www.nortekdatacenter.com/
Declaration Number	ASTM-EPD 1169
Declared Product and Declared Unit	1 unit of product - FCA and FCM
Reference PCR and Version Number	ISO 21930:2017 Sustainability in buildings and civil engineering works - Core rules for environmental product declarations of construction products and services.
Product's Intended Application and Use	Data center airflow and cooling
Product RSL	N/A
Markets of Applicability	Manufactured and sold in North America
Date of Issue	2026-04-14
Period of Validity	5 years from date of issue
EPD Type	Manufacturer Specific, Product Specific
Intended Audience	Business-to-Business
EPD Scope	Cradle to gate
Year of Reported Manufacturer Primary Data	July 2024 – June 2025
LCA Software and Version Number	SimaPro 10.2.0.3
LCI Database and Version Number	ecoinvent v3.11
LCIA Methodology and Version Number	IPCC AR6 and TRACI 2.2
The sub-category PCR review was conducted by:	N/A
Independent verification of the declaration and data, according to ISO 21930:2017 <input type="checkbox"/> Internal <input checked="" type="checkbox"/> External	Thomas Gloria, Ph.D., Industrial Ecology Consultants
This life cycle assessment was conducted in accordance with ISO 14044 and the reference PCR by:	Vicki Rybl (info@wapsustainability.com) at WAP Sustainability (1701 Market St, Chattanooga, TN 37408) commissioned by Nortek Data Center Cooling
This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by:	Thomas Gloria, Ph.D., Industrial Ecology Consultants
Limitations: <ul style="list-style-type: none"> • Environmental declarations from different programs (ISO 14025) may not be comparable. • Comparison of the environmental performance of the product 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 in results for upstream or downstream of the life cycle stages declared. 	

General Information

Company Description

Nortek Data Center Cooling (Nortek), a subsidiary of Madison Air, is a global leader in high-performance cooling infrastructure dedicated to "Cooling the Cloud while Protecting the Planet." Headquartered in Oklahoma City. It is focused on serving the data center market with innovative future-proof technology, dependable performance, adaptive solutions to difficult issues and industry-leading sustainability. Our optimized solutions maximize cooling, minimize downtime and reduce both power and water consumption. By leveraging over a million square feet of North American manufacturing capacity and a refrigerant-free technology portfolio, Nortek DCC provides hyperscale and colocation providers with scalable, sustainable cooling architectures designed to minimize environmental impact while maximizing operational uptime for high-density computing environments.

Product Description

The FCA (Fan Coil Array) and FCM (Fan Coil Module) are air handling units designed to use variable speed fans, pressure independent control valves and chilled water cooling coils remove heat from the air in a data center environment.

CSI Division: 23 82 19

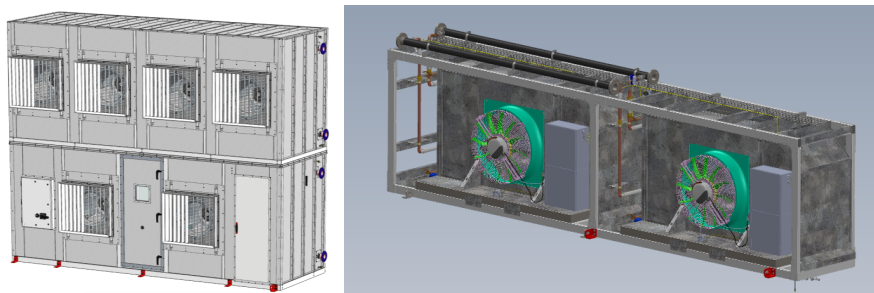


Figure 1. FCA (left), FCM (right)

Table 1: Technical Specifications

Specification	Units	FCA	FCM
Elevation	ft	2,200	1,100
Sensible Cooling Capacity	kW	577	27
Airflow	AFCM	83,888	4,980
External Static Pressure (ESP)	in. water column	0.35	0.15

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 Composition

Component	Range
Steel	60-70%
Aluminum	5-10%
Copper	20-30%
Rubber	>5%
Plastic	>5%

LCA Methodology

Declared Unit

The declared unit is 1 unit of product for the FCA and FCM respectively.

Table 3: Declared Unit

Declared Unit Information	Unit	FCA	FCM
Product mass per declared unit	kg	4,110	2,490
Packaging mass per declared unit	kg	117	117

System Boundary

The scope of the EPD is cradle to gate. Production of capital goods, and personnel-related activities are excluded, as are long-term emissions. Impacts from waste treatment are accounted for in the module where generated.

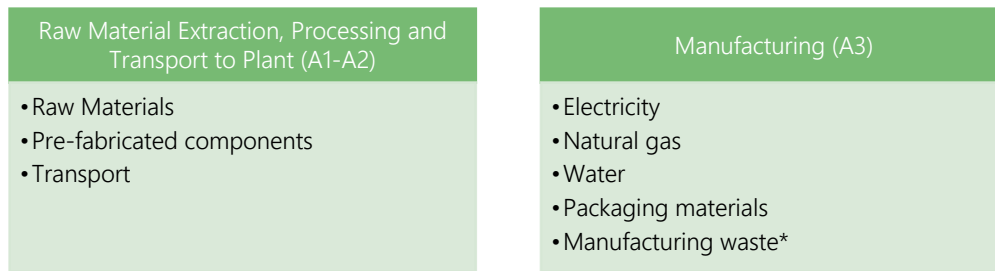


Figure 2: System Diagram

*Recycled waste flows are considered to reach end of waste state when they enter the recycling facility

Table 4: Modules Declared and Data Variation

	Production			Construction		Use							End of Life				Benefits & Loads Beyond System Boundary
	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
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

X = Module included in LCA, ND = Module not declared

Allocation

General principles of allocation are based on ISO 14040/44. There are no products other than the product under study that are produced as part of the specific manufacturing processes under study. To derive a per-unit value for manufacturing inputs such as electricity, thermal energy and water, allocation based on total production by number of units produced was adopted. No



burdens are allocated across the system boundary with secondary material, secondary fuel, or recovered energy flows arising from waste.

Cut-off rules

Inputs or outputs 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 were 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 and impact of the declared unit. Some material inputs may have been excluded within the ecoinvent datasets used for this project.

Period Under Review

Data were collected for July 2024 through June 2025.

Technical Scenarios

Manufacturing Description

The manufacturing process follows a structured, end-to-end workflow designed to ensure efficient production and consistent product quality. Operations begin with production planning and scheduling, which drives both purchasing activities and the release of work orders to the shop floor. Materials are procured through a controlled purchasing process and verified upon receipt before entering inventory.

Production activities – including fabrication, welding, and assembly – are carried out according to defined work instructions and monitored through in-process inspections. Throughout manufacturing, products undergo testing and verification to confirm compliance with specifications. A final quality inspection ensures customer requirements are fully met before products are released.

Once approved, finished goods are transferred to the warehouse for shipment, completing a process that emphasizes traceability, quality control, and timely delivery.

Packaging

Packaging requirements per declared unit are presented in the table below. The packaging for the FCA and FCM products is the same.

Table 5: Product Composition

Material	Quantity (kg/declared unit)	Biogenic Carbon (kg C/kg material)
Steel	8.0	-
Plastic	67	-
Wood	42	0.43

Environmental Performance

Abbreviation		Unit
IPCC AR6		
GWP	Global warming potential (100 years, excluding biogenic CO ₂)	kg CO ₂ eq
TRACI 2.2		
AP	Acidification potential of soil and water	kg SO ₂ eq
EP-freshwater	Eutrophication potential, freshwater	kg P eq
EP-marine	Eutrophication potential, marine	kg N eq
ODP	Depletion of stratospheric ozone layer	kg CFC 11 eq
SFP	Smog formation potential	kg O ₃ eq
Resource Use Parameters		
RPR _E	Use of renewable primary energy excl. renewable primary energy resources used as raw materials	MJ, net calorific value (LHV)
RPR _M	Use of renewable primary energy resources used as raw materials	MJ, net calorific value
NRPR _E	Use of non-renewable primary energy excl. non-renewable primary energy resources used as raw materials	MJ, net calorific value
NRPR _M	Use of non-renewable primary energy resources used as raw materials	MJ, net calorific value
SM	Use of secondary materials	kg
RSF	Use of renewable secondary fuels	MJ, net calorific value
NRSF	Use of non-renewable secondary fuels	MJ, net calorific value
RE	Recovered energy	MJ, net calorific value
FW	Net use of fresh water	m ³
Waste Parameters and Output Flows		
HWD	Disposed-of-hazardous waste	kg
NHWD	Disposed-of non-hazardous waste	kg
HLRW	High-level radioactive waste, conditioned, to final repository	kg
ILLRW	Intermediate- and low-level radioactive waste, conditioned, to final repository	kg
CRU	Components for reuse	kg
MR	Materials for recycling	kg
MER	Materials for energy recovery	kg
EEE	Exported electrical energy	MJ
EET	Exported thermal energy	MJ
Carbon Emissions and Removals		
BCRP	Biogenic Carbon Removal from Product	kg CO ₂
BCEP	Biogenic Carbon Emission from Product	kg CO ₂
BCRK	Biogenic Carbon Removal from Packaging	kg CO ₂
BCEK	Biogenic Carbon Emission from Packaging	kg CO ₂
BCEW	Biogenic Carbon Emission from Combustion of Waste from Renewable Sources Used in Production Processes	kg CO ₂
CCE	Calcination Carbon Emissions	kg CO ₂
CCR	Carbonation Carbon Removals	kg CO ₂
CWNR	Carbon Emissions from Combustion of Waste from Non- Renewable Sources used in Production Processes	kg CO ₂

Environmental Performance Results

Table 6: LCA results for FCA

Impact	Unit	A1	A2	A3	Total
GWP	kg CO ₂ eq	2.86E+04	6.94E+02	3.94E+03	3.32E+04
AP	kg SO ₂ eq	6.30E+02	2.80E+00	1.27E+01	6.46E+02
EP-freshwater	kg P eq	1.68E+00	1.69E-03	2.74E-01	1.96E+00
EP-marine	kg N eq	3.10E+01	6.77E-01	1.25E+00	3.30E+01
ODP	kg CFC 11 eq	1.33E-04	1.11E-05	1.58E-05	1.60E-04
SFP	kg O ₃ eq	2.95E+03	8.07E+01	1.43E+02	3.18E+03
Carbon Emissions and Removals					
BCRK	kg CO ₂	0.00E+00	0.00E+00	6.31E+01	6.31E+01
BCEK	kg CO ₂	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Resource Use					
RPR _E	MJ	3.62E+04	1.96E+01	1.33E+04	4.95E+04
RPR _M	MJ	0.00E+00	0.00E+00	6.30E+02	6.30E+02
NRPR _E	MJ	9.26E+04	3.01E-02	-2.74E+03	8.99E+04
NRPR _M	MJ	4.66E+03	0.00E+00	2.96E+03	7.62E+03
SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ	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
RE	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m ³	2.00E+03	2.45E-01	1.39E+01	2.02E+03
Output Flows and Waste					
HWD	kg	5.45E+03	5.36E+00	2.79E+01	5.49E+03
NHWD	kg	1.43E+04	1.20E+01	7.99E+03	2.23E+04
HLRW	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ILLRW	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MR	kg	0.00E+00	0.00E+00	5.29E+03	5.29E+03
MER	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EET	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 7: LCA results for FCM

Impact	Unit	A1	A2	A3	Total
GWP	kg CO ₂ eq	1.70E+04	4.18E+02	3.94E+03	2.14E+04
AP	kg SO ₂ eq	4.38E+02	1.68E+00	1.27E+01	4.52E+02
EP-freshwater	kg P eq	1.15E+00	1.02E-03	2.74E-01	1.42E+00
EP-marine	kg N eq	2.08E+01	4.08E-01	1.25E+00	2.24E+01
ODP	kg CFC 11 eq	9.10E-05	6.67E-06	1.58E-05	1.14E-04
SFP	kg O ₃ eq	1.94E+03	4.86E+01	1.43E+02	2.13E+03
Carbon Emissions and Removals					
BCRK	kg CO ₂	0.00E+00	0.00E+00	6.31E+01	6.31E+01
BCEK	kg CO ₂	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Resource Use					
RPR _E	MJ	2.42E+04	1.18E+01	1.33E+04	3.75E+04
RPR _M	MJ	0.00E+00	0.00E+00	6.30E+02	6.30E+02
NRPR _E	MJ	4.97E+04	1.81E-02	-2.74E+03	4.70E+04
NRPR _M	MJ	4.64E+03	0.00E+00	2.96E+03	7.60E+03
SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ	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
RE	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m ³	1.01E+03	1.47E-01	1.39E+01	1.02E+03
Output Flows and Waste					
HWD	kg	3.24E+03	3.23E+00	2.79E+01	3.27E+03
NHWD	kg	1.02E+04	7.25E+00	7.99E+03	1.82E+04
HLRW	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ILLRW	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MR	kg	0.00E+00	0.00E+00	5.29E+03	5.29E+03
MER	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EET	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Interpretation

A dominance analysis was performed for all of the products in the LCA to show which of the life cycle modules contributes to the majority of the impacts. Due to the relevance of these impact categories to the product type and the manufacturer's interests, this dominance analysis is provided for IPCC AR6 GWP and TRACI AP, EP-freshwater, EP-marine, and SFP results.

The largest contributors for FCA and FCM are the aluminum, steel, and copper in the product. Manufacturing impacts are also a notable contributor and are mainly driven by electricity use.

References

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