PEP Ecopassport®

Product Environmental Profile – Thermafit™ Air-Cooled Modular Chillers Model AMC

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Product Environmental Profile - PEP Ecopassport.
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Company	Trane Technologies
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Registration Number	TRNE-10006-V01.01-EN

Company Description

Trane Technologies® is a world leader in heating and cooling systems, services, and solutions. Together with our brands, Trane® and Thermo King®, we bring efficient and sustainable climate innovations to buildings, homes, and transportation.

Trane helps customers succeed by providing innovative solutions that optimize indoor environments through a broad portfolio of energy-efficient heating, ventilating, and air conditioning systems, buildings, contracting and energy services, parts support, and advanced controls for homes and commercial buildings.

Trane serves engineers, contractors, and building owners on all continents and in an array of markets including education, healthcare, government, industrial/ manufacturing, data centers, lodging, retail, and commercial real estate. With more than 900 U.S. patents to date, Trane creates comfortable and energy-efficient environments around the world.

Trane systems and services have a reputation for reliability, high quality, and advanced innovation; and are available through a powerful distribution network. Trane employees and distributors are respected industry-wide for their skills and performance in designing, manufacturing, marketing, and supporting commercial and residential systems.

	Product Information
Reference Product	Thermafit™ Air-Cooled Modular Chillers Model AMC 30
Product Description	Thermafit® air-cooled modular chillers unite modular flexibility with efficient comfort while providing true redundancy and reliability. **Level up on efficiency** Variable speed compressor and fans, full heat recovery and free cooling help enhance energy efficiency. AMC utilizes full heat recovery instead of rejecting waste heat to the atmosphere. Our heat recovery option can be applied to any 4-pipe system to produce COPs of 3 to 6. Free-cooling option takes advantage of cooler ambient air temperature to help reduce energy consumption. **Thermafit® offers heating and cooling** Heat recovery reduces the overall need to operate gas or electric boilers. The air-cooled chiller would be sized for the dominant cooling load, but it provides the flexibility to reuse any or all of the waste heat. Modular system design allows the chiller-heaters to respond to varying heating loads by staging anywhere from one, up to the full bank of units in heat recovery mode, helping to optimize system efficiency. Any additional modules that are needed to meet peak cooling demand will still operate in cooling mode. **Noteworthy** • Gain higher part load efficiency by selecting a variable speed compressor and variable speed fans. • Save energy with partial or full free cooling and avoiding compressor operation when outdoor ambient temperatures are cooler. • Decarbonize by utilizing full heat recovery instead of rejecting waste heat to the atmosphere. • Brazed plate heat exchanger requires smaller amounts of refrigerant. • Dual refrigerant circuits allow for greater reliability. **Specifications** • Capacity range: 15-80 tons per module, 1-12 mod/bank • Refrigerant: R-454B • Compressor Design: Fixed speed scroll with variable speed options • Factory-Installed Optional Features: Heat recovery, Free Cooling, Tank and Pump Module, Variable Speed Drives, Electronic Isolation Valve, BMS Integration
Functional Unit	To produce 1 kW of cooling, according to the appropriate usage scenario defined the AHRI 550/590 standard and during the 22-year reference lifetime of the product
Declared Unit	To produce cooling thanks to air-to-water cooling of 96.54 kW according to the appropriate usage scenario and during the 22-year lifetime of the product. *Note: the mathematical relationship between the functional and declared unit is such that the declared unit divided by its capacity in kW equals the functional unit.*
Other Products Covered	List of other products covered in this PEP is presented in the section which concerned the extrapolation rules
Reference Lifetime*	22 Years

*Reference lifetime was defined as 22 years by the Product Category Rules which governed this analysis.

Technical Characteristics	
Data Point	**Thermafit™ Air-Cooled Modular Chillers Model AMC 30**
Product Category	Chiller
Chiller Technology	Air to water
Reversible or Non-reversible	Non-reversible
Cooling Capacity*	27.45 tons 96.54 kW
IPLV*	0.84 kW/ton 4.19 kW/kW
Refrigerant Used	R-454B
Refill Threshold**	90%

*Capacity and IPLV at AHRI 550/590 conditions
**Refill threshold denotes the ratio of refrigerant (expressed as a %) at which a refill back up to the original charge takes place. Per the Product Category Rules, the refill threshold is considered 90% by default.

Constituent Materials >> Total weight of the reference product: 1,134 kg					
Plastics as % of weight		**Metals as % of weight**		**Others as % of weight**	
Product only: 1,134 kg					
Nylon	0.1%	Steel	78.5%	Electronic components	8.2%
Other plastics	0.6%	Copper	4.3%	Refrigerant	1.4%
		Cast Iron	3.5%	Other miscellaneous	1.0%
		Other metals	2.4%		
Packaging only: 0 kg					
	0%%		0%		0%
Total plastics	**0.7%**	**Total metals**	**88.7%**	**Total others**	**10.6%**

	Life Cycle Stages
Manufacturing	The manufacturing stage includes the production of raw and intermediate materials, as well as transportation to the manufacturer's last logistic platform for AMC chillers. The final assembly of the product is carried out at Trane's plant in Newberry, South Carolina, USA. As a member of SteelZero, Trane has pledged to procure, specify or stock 50% net-zero steel by 2030 and 100% net-zero steel by 2050. The main process steps for production include cutting, rolling, machining, brazing, welding, painting, sub- and final assemblies, and end-of-the-line testing.
Distribution	The transport from Trane's manufacturing facility to the customer was considered. The distance was calculated using averages for all shipped orders in 2024.
Installation	The installation stage includes diesel consumed by machinery used to move and place the product during installation.
Use	The use stage is conducted in alignment with the PSR, which models energy use of this air-cooled chiller associated with comfort cooling applications over its 22-year lifetime. The conditions outlined AHRI Standard 550/590 were used to set product capacity and efficiency. Refrigerant leak, replacement parts, and electricity usage are considered in this stage. Default refrigerant leak amounts from the PSR were used.
End of Life	The end-of-life stage includes transportation to the end-of-life facility of the disposal of product. End of life fates were modeled by material for the region where they are being disposed, in this case the United States.
Benefits and loads beyond the system boundaries	Throughout the life cycle of the product, net loads and benefits beyond system boundaries are included.

	Data Quality and Software
Geographical Representativeness	The geographical scope of this PEP across all life cycle stages (manufacturing, distribution, installation, customer use, and end of life) is North America (United States and Canada). Overall geographical representativeness is considered good.
Temporal Representativeness	Primary data was collected from 2024. Secondary data refers to the Ecoinvent database published in 2023. The temporal coverage for each secondary process used in the LCA model is specified in the documentation section of individual Ecoinvent datasets.
Technological Representativeness	Overall technology representativeness is considered good.
Software and Database Used	Sima Pro desktop 9.6.0.1 Ecoinvent Database Version 3.10

	Energy Model Used
Manufacturing	Manufacturing electricity considers the eGRID specific region from which the product is being manufactured in Ecoinvent's datasets (market for electricity, medium voltage {US-SERC}).
Distribution	No energy consumption occurs during the distribution stage.
Installation	No energy consumption occurs during the installation stage.
Use	Use stage electricity is modeled using an average North American grid mix dataset (market group for electricity, medium voltage {RNA}).
End of Life	No energy consumption occurs during the end-of-life stage.
Benefits and loads beyond the system boundaries	End of life benefits consider average North American electricity (market group for electricity, medium voltage {RNA}).

Environmental Impacts

EN 15804 + A2 Environmental Impact Indicators, per kW corresponding to the functional unit											
		Total Life Cycle Impacts (Excluding Module D)		Manufacturing A1-A3	Distribution A4	Installation A5	Use B1	Maintenance B2	Operational Energy Use B6	End of Life C1-C4	Module D
Climate change - total	GWP	1.43E+03	kg CO_2 eq	6.63E+01	1.27E+00	9.07E-01	6.05E-01	2.96E+00	1.34E+03	1.29E+01	-1.37E+01
Climate change - fossil fuels	GWPf	1.41E+03	kg CO_2 eq	6.55E+01	1.27E+00	9.07E-01	6.05E-01	2.96E+00	1.33E+03	1.06E+01	-1.37E+01
Climate change - biogenics	GWPb	1.12E+01	kg CO_2 eq	7.95E-01	1.48E-04	1.09E-04	0.00E+00	5.99E-04	8.15E+00	2.28E+00	-4.67E-02
Climate change - land use and land use transformation	GWPlu	4.10E+00	kg CO_2 eq	6.03E-02	3.66E-05	2.66E-05	0.00E+00	1.01E-04	4.04E+00	1.60E-04	-1.71E-02
Ozone depletion	ODP	1.40E-04	kg CFC-11 eq	1.33E-04	1.68E-08	1.22E-08	0.00E+00	4.55E-08	7.10E-06	2.08E-08	-6.53E-08
Acidification	AP	4.31E+00	mole of H+ eq	7.89E-01	3.33E-03	2.54E-03	0.00E+00	1.16E-02	3.50E+00	4.37E-03	-2.86E-01
Eutrophication, freshwater	Epf	9.72E-02	kg P eq	5.56E-03	3.10E-06	2.09E-06	0.00E+00	6.76E-06	9.16E-02	5.72E-05	-1.07E-03
Eutrophication, marine aquatic	Epm	6.12E-01	kg of N eq	7.24E-02	1.20E-03	9.45E-04	0.00E+00	4.67E-03	5.29E-01	4.36E-03	-1.70E-02
Eutrophication, terrestrial	Ept	6.91E+00	mole of N eq	8.70E-01	1.31E-02	1.04E-02	0.00E+00	5.17E-02	5.95E+00	1.64E-02	-2.21E-01
Photochemical ozone formation	POCP	2.77E+00	kg NMVOC eq	2.86E-01	4.97E-03	3.83E-03	0.00E+00	1.96E-02	2.45E+00	6.36E-03	-7.18E-02
Abiotic resource depletion – elements	ADPe	8.84E-03	kg Sb eq	8.78E-03	7.43E-08	5.18E-08	0.00E+00	1.74E-07	6.64E-05	5.36E-07	-3.52E-03
Abiotic resource depletion – fossil fuels	ADPf	2.62E+04	MJ	7.37E+02	1.67E+01	1.19E+01	0.00E+00	3.92E+01	2.54E+04	1.71E+01	-1.40E+02
Water use	WU	3.42E+02	m3 world eq	1.80E+01	1.54E-02	1.09E-02	0.00E+00	3.67E-02	3.24E+02	-5.02E-01	-5.68E+00

Note: characterization factors use the -1/+1 biogenic carbon storage assessment methodology

Inventory Flow Indicators, per kW corresponding to the functional unit											
		Total Life Cycle Impacts (Excluding Module D)		Manufacturing A1-A3	Distribution A4	Installation A5	Use B1	Maintenance B2	Operational Energy Use B6	End of Life C1-C4	Module D
Use of renewable primary energy, excluding renewable primary energy resources used as raw materials	PERE	3.63E+03	MJ	9.69E+01	2.69E-02	1.98E-02	0.00E+00	8.35E-02	3.53E+03	2.13E-01	-2.00E+01
Use of renewable primary energy resources used as raw materials	PERM	1.06E+01	MJ	1.06E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renewable primary energy resources	PERT	3.64E+03	MJ	1.08E+02	2.69E-02	1.98E-02	0.00E+00	8.35E-02	3.53E+03	2.13E-01	-2.00E+01
Use of non-renewable primary energy, excluding non-renewable primary energy resources used as raw materials	PENRM	1.16E+01	MJ	1.16E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-4.97E-02
Use of non-renewable primary energy resources used as raw materials	PENRE	2.62E+04	MJ	7.37E+02	1.67E+01	1.19E+01	0.00E+00	3.92E+01	2.54E+04	1.71E+01	-1.40E+02
Total use of non-renewable primary energy resources	PENRT	2.62E+04	MJ	7.49E+02	1.67E+01	1.19E+01	0.00E+00	3.92E+01	2.54E+04	1.71E+01	-1.40E+02
Use of secondary materials	USM	0.00E+00	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	URSF	0.00E+00	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	UNRSF	0.00E+00	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water	NUFW	1.63E+01	m 3	5.80E-01	5.62E-04	3.99E-04	0.00E+00	1.46E-03	1.58E+01	-1.13E-02	-1.63E-01
Hazardous waste disposed	HWD	7.72E-01	kg	9.76E-02	1.36E-04	9.64E-05	0.00E+00	3.32E-04	6.59E-01	1.52E-02	-3.01E-03
Non-hazardous waste disposed	NHWD	2.82E+01	kg	4.03E+00	6.95E-04	4.83E-04	0.00E+00	1.59E-03	1.26E+01	1.16E+01	-3.36E-01
Radioactive waste disposed	RWD	1.43E-01	kg	1.21E-03	6.02E-07	4.44E-07	0.00E+00	1.84E-06	1.42E-01	6.57E-06	-1.28E-04
Components for re-use	CRU	0.00E+00	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	MFR	1.04E+01	kg	2.34E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.10E+00	0.00E+00
Materials for energy recovery	MER	0.00E+00	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy	EE	9.18E-01	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.18E-01	0.00E+00

TRACI 2.1 Environmental Impact Indicators, per kW corresponding to the functional unit											
		Total Life Cycle Impacts (Excluding Module D)		Manufacturing A1-A3	Distribution A4	Installation A5	Use B1	Maintenance B2	Operational Energy Use B6	End of Life C1-C4	Module D
Ozone depletion	OD	1.80E-04	kg CFC-11 eq	1.65E-04	1.78E-08	1.29E-08	0.00E+00	4.82E-08	1.50E-05	2.24E-08	-8.80E-08
Global warming	GW	1.40E+03	kg CO2 eq	6.48E+01	1.26E+00	8.97E-01	5.30E-01	2.92E+00	1.32E+03	1.08E+01	-1.35E+01
Smog	SG	3.78E+01	kg O3 eq	4.33E+00	7.63E-02	6.02E-02	9.87E-05	3.01E-01	3.29E+01	9.41E-02	-1.05E+00
Acidification	A	3.62E+00	kg SO2 eq	6.30E-01	3.00E-03	2.29E-03	0.00E+00	1.05E-02	2.97E+00	3.96E-03	-2.25E-01
Eutrophication	E	8.06E-01	kg N eq	6.11E-02	2.04E-04	1.55E-04	0.00E+00	6.91E-04	7.40E-01	4.03E-03	-1.08E-02
Carcinogenics	C	6.86E-06	CTUh	3.22E-06	9.16E-10	6.80E-10	0.00E+00	4.93E-09	3.60E-06	2.13E-08	-8.08E-07
Non carcinogenics	NC	1.06E-04	CTUh	5.24E-05	1.99E-07	1.32E-07	0.00E+00	7.35E-08	5.33E-05	4.25E-07	-2.00E-05
Respiratory effects	RE	2.16E+00	kg PM2.5 eq	1.02E-01	5.09E-04	3.65E-04	0.00E+00	1.42E-03	2.06E+00	6.94E-04	-3.34E-02
Ecotoxicity	EX	6.29E+02	CTUe	4.28E+02	4.15E+00	2.72E+00	0.00E+00	6.45E-01	1.89E+02	4.51E+00	-1.57E+02
Fossil fuel depletion	FFD	1.66E+03	MJ surplus	5.55E+01	2.36E+00	1.69E+00	0.00E+00	5.52E+00	1.60E+03	2.28E+00	-8.08E+00

EN 15804 + A2 Environmental Impact Indicators, per device corresponding to the reference product											
		Total Life Cycle Impacts (Excluding Module D)		Manufacturing A1-A3	Distribution A4	Installation A5	Use B1	Maintenance B2	Operational Energy Use B6	End of Life C1-C4	Module D
Climate change - total	GWP	1.38E+05	kg CO_2 eq	6.40E+03	1.23E+02	8.76E+01	5.85E+01	2.85E+02	1.30E+05	1.25E+03	-1.33E+03
Climate change - fossil fuels	GWPf	1.36E+05	kg CO_2 eq	6.32E+03	1.23E+02	8.76E+01	5.85E+01	2.85E+02	1.28E+05	1.03E+03	-1.32E+03
Climate change - biogenics	GWPb	1.08E+03	kg CO_2 eq	7.67E+01	1.43E-02	1.05E-02	0.00E+00	5.78E-02	7.87E+02	2.20E+02	-4.50E+00
Climate change - land use and land use transformation	GWPlu	3.96E+02	kg CO_2 eq	5.82E+00	3.54E-03	2.56E-03	0.00E+00	9.73E-03	3.90E+02	1.54E-02	-1.65E+00
Ozone depletion	ODP	1.35E-02	kg CFC-11 eq	1.28E-02	1.62E-06	1.18E-06	0.00E+00	4.39E-06	6.85E-04	2.01E-06	-6.30E-06
Acidification	AP	4.16E+02	mole of H+ eq	7.61E+01	3.22E-01	2.45E-01	0.00E+00	1.12E+00	3.38E+02	4.22E-01	-2.76E+01
Eutrophication, freshwater	Epf	9.39E+00	kg P eq	5.37E-01	2.99E-04	2.02E-04	0.00E+00	6.53E-04	8.84E+00	5.52E-03	-1.04E-01
Eutrophication, marine aquatic	Epm	5.91E+01	kg of N eq	6.99E+00	1.16E-01	9.12E-02	0.00E+00	4.50E-01	5.10E+01	4.21E-01	-1.64E+00
Eutrophication, terrestrial	Ept	6.68E+02	mole of N eq	8.40E+01	1.27E+00	1.00E+00	0.00E+00	4.99E+00	5.75E+02	1.58E+00	-2.13E+01
Photochemical ozone formation	POCP	2.67E+02	kg NMVOC eq	2.76E+01	4.80E-01	3.70E-01	0.00E+00	1.89E+00	2.37E+02	6.14E-01	-6.93E+00
Abiotic resource depletion – elements	ADPe	8.54E-01	kg Sb eq	8.47E-01	7.17E-06	5.00E-06	0.00E+00	1.68E-05	6.41E-03	5.18E-05	-3.40E-01
Abiotic resource depletion – fossil fuels	ADPf	2.53E+06	MJ	7.12E+04	1.61E+03	1.15E+03	0.00E+00	3.78E+03	2.45E+06	1.65E+03	-1.35E+04
Water use	WU	3.30E+04	m3 world eq	1.74E+03	1.49E+00	1.05E+00	0.00E+00	3.54E+00	3.13E+04	-4.85E+01	-5.48E+02

Note: characterization factors use the -1/+1 biogenic carbon storage assessment methodology

Inventory Flow Indicators, per device corresponding to the reference product											
		Total Life Cycle Impacts (Excluding Module D)		Manufacturing A1-A3	Distribution A4	Installation A5	Use B1	Maintenance B2	Operational Energy Use B6	End of Life C1-C4	Module D
Use of renewable primary energy, excluding renewable primary energy resources used as raw materials	PERE	3.50E+05	MJ	9.36E+03	2.59E+00	1.91E+00	0.00E+00	8.06E+00	3.41E+05	2.05E+01	-1.93E+03
Use of renewable primary energy resources used as raw materials	PERM	1.02E+03	MJ	1.02E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renewable primary energy resources	PERT	3.51E+05	MJ	1.04E+04	2.59E+00	1.91E+00	0.00E+00	8.06E+00	3.41E+05	2.05E+01	-1.93E+03
Use of non-renewable primary energy, excluding non-renewable primary energy resources used as raw materials	PENRM	1.12E+03	MJ	1.12E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-4.80E+00
Use of non-renewable primary energy resources used as raw materials	PENRE	2.53E+06	MJ	7.12E+04	1.61E+03	1.15E+03	0.00E+00	3.78E+03	2.45E+06	1.65E+03	-1.35E+04
Total use of non-renewable primary energy resources	PENRT	2.53E+06	MJ	7.23E+04	1.61E+03	1.15E+03	0.00E+00	3.78E+03	2.45E+06	1.65E+03	-1.35E+04
Use of secondary materials	USM	0.00E+00	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	URSF	0.00E+00	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	UNRSF	0.00E+00	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water	NUFW	1.58E+03	m3	5.60E+01	5.43E-02	3.85E-02	0.00E+00	1.41E-01	1.52E+03	-1.09E+00	-1.57E+01
Hazardous waste disposed	HWD	7.45E+01	kg	9.42E+00	1.31E-02	9.31E-03	0.00E+00	3.21E-02	6.36E+01	1.47E+00	-2.91E-01
Non-hazardous waste disposed	NHWD	2.72E+03	kg	3.89E+02	6.71E-02	4.66E-02	0.00E+00	1.53E-01	1.22E+03	1.12E+03	-3.24E+01
Radioactive waste disposed	RWD	1.38E+01	kg	1.16E-01	5.81E-05	4.29E-05	0.00E+00	1.78E-04	1.37E+01	6.34E-04	-1.23E-02
Components for re-use	CRU	0.00E+00	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	MFR	1.01E+03	kg	2.26E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.82E+02	0.00E+00
Materials for energy recovery	MER	0.00E+00	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy	EE	8.86E+01	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.86E+01	0.00E+00

TRACI 2.1 Environmental Impact Indicators, per device corresponding to the reference product											
		Total Life Cycle Impacts (Excluding Module D)		Manufacturing A1-A3	Distribution A4	Installation A5	Use B1	Maintenance B2	Operational Energy Use B6	End of Life C1-C4	Module D
Ozone depletion	OD	1.74E-02	kg CFC-11 eq	1.60E-02	1.72E-06	1.25E-06	0.00E+00	4.65E-06	1.45E-03	2.17E-06	-8.50E-06
Global warming	GW	1.35E+05	kg CO2 eq	6.26E+03	1.21E+02	8.66E+01	5.12E+01	2.82E+02	1.28E+05	1.05E+03	-1.30E+03
Smog	SG	3.65E+03	kg O3 eq	4.18E+02	7.36E+00	5.81E+00	9.53E-03	2.90E+01	3.18E+03	9.09E+00	-1.01E+02
Acidification	A	3.49E+02	kg SO2 eq	6.08E+01	2.89E-01	2.21E-01	0.00E+00	1.02E+00	2.87E+02	3.82E-01	-2.17E+01
Eutrophication	E	7.78E+01	kg N eq	5.90E+00	1.97E-02	1.50E-02	0.00E+00	6.67E-02	7.15E+01	3.89E-01	-1.04E+00
Carcinogenics	C	6.62E-04	CTUh	3.11E-04	8.84E-08	6.56E-08	0.00E+00	4.76E-07	3.48E-04	2.06E-06	-7.80E-05
Non carcinogenics	NC	1.03E-02	CTUh	5.05E-03	1.92E-05	1.27E-05	0.00E+00	7.10E-06	5.14E-03	4.10E-05	-1.93E-03
Respiratory effects	RE	2.09E+02	kg PM2.5 eq	9.86E+00	4.91E-02	3.52E-02	0.00E+00	1.37E-01	1.99E+02	6.70E-02	-3.23E+00
Ecotoxicity	EX	6.07E+04	CTUe	4.13E+04	4.01E+02	2.62E+02	0.00E+00	6.23E+01	1.82E+04	4.35E+02	-1.51E+04
Fossil fuel depletion	FFD	1.61E+05	MJ surplus	5.36E+03	2.28E+02	1.63E+02	0.00E+00	5.33E+02	1.54E+05	2.20E+02	-7.80E+02

Extrapolation Factors

AMC products are part of a homogenous family of Trane chillers. Additional products covered by this PEP are detailed below, with the reference product denoted in blue.

AMC 15
AMC 20
AMC 25
AMC 30
AMC 40
AMC 50
AMC 60
AMC 80

For products other than the reference product, the environmental impacts can be calculated using the extrapolation rules below. The following tables contain factors to be used in the extrapolation of LCIA results for the AMC Chillers covered in this report. These scaling factors are intended to allow interested parties to determine the environmental impacts of AMC products of interest.

Extrapolation coefficients are given for the environmental impact of the functional unit, i.e. the emission of 1 kW cooling power. For each stage of the life cycle, the environmental impacts of the product concerned are calculated by multiplying the impacts of the declaration corresponding to the reference product by the extrapolation coefficient. The "Total" column should be calculated by adding the environmental impacts of each stage of the life cycle.

To use these scaling factors, individuals should:

1. Identify the LCIA result of interest and product of interest.

2. Multiply the results in the reference product's environmental impact indicator table, found on page 4-7, by the corresponding cell in the table that pertains to the product of interest, found below.

	Extrapolation Factors – Declared Unit								Extrapolation Factors – Functional Unit							
Product	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B6**	**C1-C4**	**D**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B6**	**C1-C4**	**D**
AMC 15	0.72	0.72	1.00	1.0	1.0	0.50	0.72	0.72	1.43	1.43	1.99	1.99	1.99	1.00	1.43	1.43
AMC 20	0.72	0.72	1.00	1.00	1.00	0.71	0.72	0.72	1.11	1.11	1.54	1.54	1.54	1.08	1.11	1.11
AMC 25	1.00	1.00	1.00	1.00	1.00	0.82	1.00	1.00	1.16	1.16	1.16	1.16	1.16	0.95	1.16	1.16
AMC 30	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**
AMC 40	1.20	1.20	1.00	1.00	1.00	1.28	1.20	1.20	0.97	0.97	0.81	0.81	0.81	1.04	0.97	0.97
AMC 50	2.00	2.00	1.00	1.00	1.00	1.46	2.00	2.00	1.25	1.25	0.63	0.63	0.63	0.92	1.25	1.25
AMC 60	2.00	2.00	1.00	1.00	1.00	1.97	2.00	2.00	0.99	0.99	0.49	0.49	0.49	0.98	0.99	0.99
AMC 80	2.40	2.40	1.00	1.00	1.00	2.49	2.40	2.40	0.95	0.95	0.40	0.40	0.40	0.99	0.95	0.95

Comparability

EPDs published within the same product category, though originating from different programs, may not be comparable. Full conformance with a PCR allows PEP comparability only when all stages of a life cycle have been considered. However, variations and deviations are possible.

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