PEP Ecopassport®

Product Environmental Profile – Thermafit™ Air-Source Modular Multi-pipe Units Model MAS

DECEMBER 2025 RN TRNE-10008-V0.1.01-EN

Product Environmental Profile - PEP Ecopassport.
Document in compliance with ISO 14025: 2006 "Environmental labels and declarations. Type III environmental declarations."

Company	Trane Technologies
Contact Information	TraneCommercialEPD@tranetechnologies.com
Registration Number	TRNE-10008-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-Source Modular Multi-pipe Units Model MAS 30
Product Description	Thermafit® air-source multi-pipe units provide all-electric simultaneous heating and cooling. **Up to 8.2 times more efficient than other forms of electric heating** Thermafit® model MAS is an all-in-one solution that eliminates the need for separate boiler and chiller systems to fulfill simultaneous heating and cooling needs. The unit can act as a chiller to cool the building, as a heat pump to heat the building, or as a heat recovery unit to deliver simultaneous heating and cooling. Thermafit® MAS can provide chilled water and hot water at the same time, controlling two independent chilled water and hot water setpoints. Building owners currently developing or implementing decarbonization, sustainability, or ESG initiatives will find Thermafit® model MAS the ideal solution wherever electrification regulations and policies are changing. **Noteworthy** • Vapor injection extends the operating range of the compressor enabling hot water temperatures of up to 140°F (130°F at 0°F outdoor ambient temperatures). • Electronically controlled valves direct flow of refrigerant for each mode of operation. • Braze plate heat exchangers (BPHE) for dedicated cooling and heating. • ECM fans with variable speed fan/motor assemblies to reduce fan power when ambient conditions allow it. • 3/4" insulation on each brazed plate heat exchanger, fluid piping, and components to help improve efficiency by reducing heat loss or gain depending on operating mode. • A tandem scroll compressor that provides better unloading and can provide up to 50% turndown per module for greater part load efficiency. **Specifications** • Capacity range: 30 ton (433 MBH) per module, 3-10 mod/bank • Refrigerant: R-454B • Compressor Design: Vapor injection scroll compressor for cold climate operation • Factory-Installed Optional Features: BMS Integration and Pump Module
Functional Unit	To produce 1 kW of heating and cooling according to the appropriate usage scenario defined in the AHRI 550/590 standard and during the 22-year reference lifetime of the product.
Declared Unit	To produce simultaneous heating and cooling thanks to air-to-water heating of 698.87 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	None
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-Source Modular Multi-pipe Units Model MAS 30
Product Category	Heat Pump
Chiller Technology	Air to water
Reversible or Non-reversible	Reversible
Simultaneous Heating and Cooling Capacity*	198.7 tons 698.87 kW
Simultaneous COP*	8.52 kW/kW
Refrigerant Used	R-454B
Refill Threshold**	90%

*Capacity and COP 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: 1,361 kg					
Plastics as % of weight		Metals as % of weight		Others as % of weight	
Product only: 1,361 kg					
Nylon	0.05%	Steel	76.53%	Refrigerant	2.90%
Various plastics	0.04%	Copper	8.14%	Rubber	0.57%
		Aluminum	4.14%	Other miscellaneous	0.72%
		Other metals	6.91%		
Packaging only: 0 kg					
	0%		0%		0%
Total plastics	**0.09%**	**Total metals**	**95.72%**	**Total others**	**4.19%**

	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 MAS multi-pipe heat pumps. 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-source multi-pipe heat pump associated with comfort heating and 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	2.29E+03	kg CO_2 eq	1.22E+01	2.34E-01	1.25E-01	8.36E-02	4.08E-01	2.27E+03	3.68E+00	-2.89E+00
Climate change - fossil fuels	GWPf	2.27E+03	kg CO_2 eq	1.20E+01	2.34E-01	1.25E-01	8.36E-02	4.08E-01	2.25E+03	3.34E+00	-2.88E+00
Climate change - biogenics	GWPb	1.43E+01	kg CO_2 eq	1.57E-01	2.72E-05	1.50E-05	0.00E+00	8.27E-05	1.38E+01	3.31E-01	-1.06E-02
Climate change - land use and land use transformation	GWPlu	6.85E+00	kg CO_2 eq	1.76E-02	6.74E-06	3.67E-06	0.00E+00	1.39E-05	6.84E+00	3.89E-05	-7.26E-03
Ozone depletion	ODP	5.63E-05	kg CFC-11 eq	4.43E-05	3.09E-09	1.69E-09	0.00E+00	6.28E-09	1.20E-05	4.44E-09	-1.57E-08
Acidification	AP	6.09E+00	mole of H+ eq	1.64E-01	6.14E-04	3.50E-04	0.00E+00	1.60E-03	5.93E+00	8.26E-04	-5.68E-02
Eutrophication, freshwater	Epf	1.56E-01	kg P eq	1.03E-03	5.71E-07	2.89E-07	0.00E+00	9.34E-07	1.55E-01	9.97E-06	-2.11E-04
Eutrophication, marine aquatic	Epm	9.10E-01	kg of N eq	1.36E-02	2.21E-04	1.31E-04	0.00E+00	6.45E-04	8.94E-01	6.81E-04	-3.53E-03
Eutrophication, terrestrial	Ept	1.03E+01	mole of N eq	1.66E-01	2.42E-03	1.43E-03	0.00E+00	7.14E-03	1.01E+01	2.94E-03	-4.51E-02
Photochemical ozone formation	POCP	4.21E+00	kg NMVOC eq	5.37E-02	9.16E-04	5.29E-04	0.00E+00	2.70E-03	4.15E+00	1.12E-03	-1.49E-02
Abiotic resource depletion – elements	ADPe	1.80E-03	kg Sb eq	1.69E-03	1.37E-08	7.15E-09	0.00E+00	2.40E-08	1.12E-04	2.68E-07	-6.53E-04
Abiotic resource depletion – fossil fuels	ADPf	4.31E+04	MJ	1.30E+02	3.08E+00	1.65E+00	0.00E+00	5.41E+00	4.30E+04	3.14E+00	-2.96E+01
Water use	WU	5.52E+02	m3 world eq	3.55E+00	2.84E-03	1.50E-03	0.00E+00	5.07E-03	5.49E+02	-6.57E-02	-1.11E+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	6.00E+03	MJ	2.04E+01	4.95E-03	2.73E-03	0.00E+00	1.15E-02	5.98E+03	4.75E-02	-5.70E+00
Use of renewable primary energy resources used as raw materials	PERM	1.76E+00	MJ	1.76E+00	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	6.00E+03	MJ	2.21E+01	4.95E-03	2.73E-03	0.00E+00	1.15E-02	5.98E+03	4.75E-02	-5.70E+00
Use of non-renewable primary energy, excluding non-renewable primary energy resources used as raw materials	PENRM	2.03E+00	MJ	2.03E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-2.41E-01
Use of non-renewable primary energy resources used as raw materials	PENRE	4.31E+04	MJ	1.30E+02	3.08E+00	1.65E+00	0.00E+00	5.41E+00	4.30E+04	3.14E+00	-2.96E+01
Total use of non-renewable primary energy resources	PENRT	4.31E+04	MJ	1.32E+02	3.08E+00	1.65E+00	0.00E+00	5.41E+00	4.30E+04	3.14E+00	-2.99E+01
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	2.68E+01	m3	1.22E-01	1.04E-04	5.51E-05	0.00E+00	2.01E-04	2.67E+01	-1.44E-03	-3.84E-02
Hazardous waste disposed	HWD	1.14E+00	kg	1.57E-02	2.50E-05	1.33E-05	0.00E+00	4.59E-05	1.11E+00	8.23E-03	-5.79E-04
Non-hazardous waste disposed	NHWD	2.39E+01	kg	6.83E-01	1.28E-04	6.67E-05	0.00E+00	2.19E-04	2.14E+01	1.89E+00	-6.79E-02
Radioactive waste disposed	RWD	2.40E-01	kg	2.10E-04	1.11E-07	6.14E-08	0.00E+00	2.55E-07	2.40E-01	1.20E-06	-2.82E-05
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	1.78E+00	kg	3.89E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.39E+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	2.67E-01	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.67E-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	8.05E-05	kg CFC-11 eq	5.51E-05	3.28E-09	1.79E-09	0.00E+00	6.65E-09	2.54E-05	4.79E-09	-2.00E-08
Global warming	GW	2.25E+03	kg CO2 eq	1.19E+01	2.31E-01	1.24E-01	7.32E-02	4.03E-01	2.24E+03	3.16E+00	-2.84E+00
Smog	SG	5.66E+01	kg O3 eq	8.14E-01	1.40E-02	8.31E-03	1.36E-05	4.16E-02	5.57E+01	1.71E-02	-2.18E-01
Acidification	A	5.16E+00	kg SO2 eq	1.30E-01	5.52E-04	3.16E-04	0.00E+00	1.46E-03	5.03E+00	7.43E-04	-4.47E-02
Eutrophication	E	1.26E+00	kg N eq	1.10E-02	3.76E-05	2.14E-05	0.00E+00	9.54E-05	1.25E+00	6.04E-04	-2.14E-03
Carcinogenics	C	6.73E-06	CTUh	6.33E-07	1.69E-10	9.39E-11	0.00E+00	6.81E-10	6.09E-06	5.61E-09	-2.29E-07
Non carcinogenics	NC	1.01E-04	CTUh	1.08E-05	3.68E-08	1.82E-08	0.00E+00	1.02E-08	9.01E-05	6.76E-08	-3.78E-06
Respiratory effects	RE	3.50E+00	kg PM2.5 eq	1.98E-02	9.37E-05	5.04E-05	0.00E+00	1.96E-04	3.48E+00	1.32E-04	-6.80E-03
Ecotoxicity	EX	3.95E+02	CTUe	7.29E+01	7.64E-01	3.75E-01	0.00E+00	8.91E-02	3.20E+02	8.29E-01	-2.78E+01
Fossil fuel depletion	FFD	2.71E+03	MJ surplus	9.80E+00	4.35E-01	2.33E-01	0.00E+00	7.63E-01	2.70E+03	4.14E-01	-1.83E+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	1.60E+06	kg CO_2 eq	8.50E+03	1.63E+02	8.76E+01	5.85E+01	2.85E+02	1.59E+06	2.57E+03	-2.02E+03
Climate change - fossil fuels	GWPf	1.58E+06	kg CO_2 eq	8.38E+03	1.63E+02	8.76E+01	5.85E+01	2.85E+02	1.57E+06	2.34E+03	-2.01E+03
Climate change - biogenics	GWPb	9.98E+03	kg CO_2 eq	1.10E+02	1.90E-02	1.05E-02	0.00E+00	5.78E-02	9.64E+03	2.31E+02	-7.41E+00
Climate change - land use and land use transformation	GWPlu	4.79E+03	kg CO_2 eq	1.23E+01	4.71E-03	2.56E-03	0.00E+00	9.73E-03	4.78E+03	2.72E-02	-5.07E+00
Ozone depletion	ODP	3.94E-02	kg CFC-11 eq	3.10E-02	2.16E-06	1.18E-06	0.00E+00	4.39E-06	8.39E-03	3.11E-06	-1.10E-05
Acidification	AP	4.26E+03	mole of H+ eq	1.14E+02	4.29E-01	2.45E-01	0.00E+00	1.12E+00	4.14E+03	5.77E-01	-3.97E+01
Eutrophication, freshwater	Epf	1.09E+02	kg P eq	7.17E-01	3.99E-04	2.02E-04	0.00E+00	6.53E-04	1.08E+02	6.97E-03	-1.48E-01
Eutrophication, marine aquatic	Epm	6.36E+02	kg of N eq	9.49E+00	1.54E-01	9.12E-02	0.00E+00	4.50E-01	6.25E+02	4.76E-01	-2.46E+00
Eutrophication, terrestrial	Ept	7.17E+03	mole of N eq	1.16E+02	1.69E+00	1.00E+00	0.00E+00	4.99E+00	7.04E+03	2.05E+00	-3.15E+01
Photochemical ozone formation	POCP	2.94E+03	kg NMVOC eq	3.76E+01	6.40E-01	3.70E-01	0.00E+00	1.89E+00	2.90E+03	7.83E-01	-1.04E+01
Abiotic resource depletion – elements	ADPe	1.26E+00	kg Sb eq	1.18E+00	9.56E-06	5.00E-06	0.00E+00	1.68E-05	7.85E-02	1.87E-04	-4.57E-01
Abiotic resource depletion – fossil fuels	ADPf	3.01E+07	MJ	9.08E+04	2.15E+03	1.15E+03	0.00E+00	3.78E+03	3.00E+07	2.20E+03	-2.07E+04
Water use	WU	3.86E+05	m3 world eq	2.48E+03	1.98E+00	1.05E+00	0.00E+00	3.54E+00	3.83E+05	-4.59E+01	-7.73E+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	4.19E+06	MJ	1.42E+04	3.46E+00	1.91E+00	0.00E+00	8.06E+00	4.18E+06	3.32E+01	-3.98E+03
Use of renewable primary energy resources used as raw materials	PERM	1.23E+03	MJ	1.23E+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	4.19E+06	MJ	1.55E+04	3.46E+00	1.91E+00	0.00E+00	8.06E+00	4.18E+06	3.32E+01	-3.98E+03
Use of non-renewable primary energy, excluding non-renewable primary energy resources used as raw materials	PENRM	1.42E+03	MJ	1.42E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.68E+02
Use of non-renewable primary energy resources used as raw materials	PENRE	3.01E+07	MJ	9.08E+04	2.15E+03	1.15E+03	0.00E+00	3.78E+03	3.00E+07	2.20E+03	-2.07E+04
Total use of non-renewable primary energy resources	PENRT	3.01E+07	MJ	9.23E+04	2.15E+03	1.15E+03	0.00E+00	3.78E+03	3.00E+07	2.20E+03	-2.09E+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	1.87E+04	m3	8.50E+01	7.23E-02	3.85E-02	0.00E+00	1.41E-01	1.86E+04	-1.01E+00	-2.69E+01
Hazardous waste disposed	HWD	7.96E+02	kg	1.10E+01	1.75E-02	9.31E-03	0.00E+00	3.21E-02	7.79E+02	5.75E+00	-4.05E-01
Non-hazardous waste disposed	NHWD	1.67E+04	kg	4.77E+02	8.94E-02	4.66E-02	0.00E+00	1.53E-01	1.49E+04	1.32E+03	-4.75E+01
Radioactive waste disposed	RWD	1.68E+02	kg	1.47E-01	7.75E-05	4.29E-05	0.00E+00	1.78E-04	1.67E+02	8.36E-04	-1.97E-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	1.24E+03	kg	2.72E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.70E+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	1.87E+02	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.87E+02	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	5.62E-02	kg CFC-11 eq	3.85E-02	2.29E-06	1.25E-06	0.00E+00	4.65E-06	1.77E-02	3.35E-06	-1.40E-05
Global warming	GW	1.57E+06	kg CO2 eq	8.30E+03	1.62E+02	8.66E+01	5.12E+01	2.82E+02	1.56E+06	2.21E+03	-1.98E+03
Smog	SG	3.95E+04	kg O3 eq	5.69E+02	9.81E+00	5.81E+00	9.53E-03	2.90E+01	3.89E+04	1.19E+01	-1.53E+02
Acidification	A	3.61E+03	kg SO2 eq	9.08E+01	3.86E-01	2.21E-01	0.00E+00	1.02E+00	3.51E+03	5.19E-01	-3.12E+01
Eutrophication	E	8.84E+02	kg N eq	7.70E+00	2.63E-02	1.50E-02	0.00E+00	6.67E-02	8.75E+02	4.22E-01	-1.50E+00
Carcinogenics	C	4.71E-03	CTUh	4.42E-04	1.18E-07	6.56E-08	0.00E+00	4.76E-07	4.26E-03	3.92E-06	-1.60E-04
Non carcinogenics	NC	7.06E-02	CTUh	7.57E-03	2.57E-05	1.27E-05	0.00E+00	7.10E-06	6.30E-02	4.72E-05	-2.64E-03
Respiratory effects	RE	2.45E+03	kg PM2.5 eq	1.38E+01	6.55E-02	3.52E-02	0.00E+00	1.37E-01	2.43E+03	9.20E-02	-4.75E+00
Ecotoxicity	EX	2.76E+05	CTUe	5.09E+04	5.34E+02	2.62E+02	0.00E+00	6.23E+01	2.23E+05	5.80E+02	-1.94E+04
Fossil fuel depletion	FFD	1.90E+06	MJ surplus	6.85E+03	3.04E+02	1.63E+02	0.00E+00	5.33E+02	1.89E+06	2.89E+02	-1.28E+03

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.

References

AHRI. (2023, June). *AHRI 550/590 (I-P) and 551/591 (SI): Performance Rating of Water-Chilling and Heat Pump Water-Heating Packages Using the Vapor Compression Cycle.* Retrieved from Air-Conditioning, Heating, and Refrigeration Institute: https://www.ahrinet.org/system/files/2024-09/ANSI%20AHRI%20Standard%20550%20590-2023%20%28I-P%29%20editorial%20update.pdf

AISI & SMA. (2021). *Determination of Steel Recycling Ratesd in the United States.* American Iron and Steel Institute and Steel Manufacturers Association.

CEN. (2019). *EN 15804+A2: Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products.* European Committee for Standardization.

IPCC. (2021). *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change.* [Masson-Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)]. United Kingdom and New York, NY, USA: Cambridge University Press.

ISO. (2006). *Environmental labels and declarations - Type III environmental declarations - Principles and Procedures.* Geneva: International Organization for Standardization.

ISO. (2006). *ISO 14040/Amd 1:2020: Environmental management - Life cycle assessment - Principles and framework.* Geneva: International Organization for Standardization.

ISO. (2006). *ISO 14044/Amd 1:2017/Amd 2:2020: Environmental Management - Life cycle assessment - Requirements and Guidelines.* Geneva: International Organization for Standardization.

The Aluminum Association. (2025). *Infinitely Recyclable*. Retrieved from The Aluminum Association: https://www.aluminum.org/Recycling

Trane. (2025, September). *Trane Thermafit™ Modular Unit Chillers and Heat Pumps.* Retrieved from Trane Commercial North America: https://www.trane.com/commercial/north-america/us/en/products-systems/chillers/modular-chillers.html

US EPA. (2024, November). *Durable Goods: Product-Specific Data*. Retrieved from United States Environmental Protection Agency: https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/durable-goods-product-specific-data

US EPA. (2024, November). *Other Nonferrous Metals: Material-Specific Data*. Retrieved from United States Environmental Protection Agency: https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/other-nonferrous-metals-material-specific

US EPA. (2024, November). *Plastics: Material-Specific Data*. Retrieved from United States Environmental Protection Agency: https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/plastics-material-specific-data

US EPA. (2024, November). *Rubber and Leather: Material-Specific Data*. Retrieved from United States Environmental Protection Agency: https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/rubber-and-leather-material-specific-data

Registration number: TRNE-10008-V01.01-EN	**Drafting rules:** "PEP-PCR-ed4-EN-2021 09 06" **Supplemented by** "PSR-0013-ed3.0-EN-2023 06 06"
Verifier accreditation number: VH44	Information and reference documents: www.pep-ecopassport.org
Date of issue: 12-2025	**Validity period:** 5 years
Independent verification of the declaration and data in compliance with ISO 14025:2006	
Internal:	**External:** ☑
The PCR review was conducted by a panel of experts chaired by Julie Orgelet (DDemain)	
PEPs are compliant with XP C08-100-1:2016 and EN 50693:2019 The components of the present PEP may not be compared with components from any other program.	
Document complies with ISO 14025:2006 "Environmental labels and declarations. Type III environmental declarations"	

Trane – by Trane Technologies (NYSE: TT), a global climate innovator – creates comfortable, energy efficient indoor environments through a broad portfolio of heating, ventilating and air conditioning systems and controls, services, parts and supply. For more information, please visit *trane.com or tranetechnologies.com.*