

# Embodied Carbon Disclosure: VariTrane® Single Duct Terminal VAV Unit



TM65 North American Methodology, ASHRAE® and CIBSE 2024

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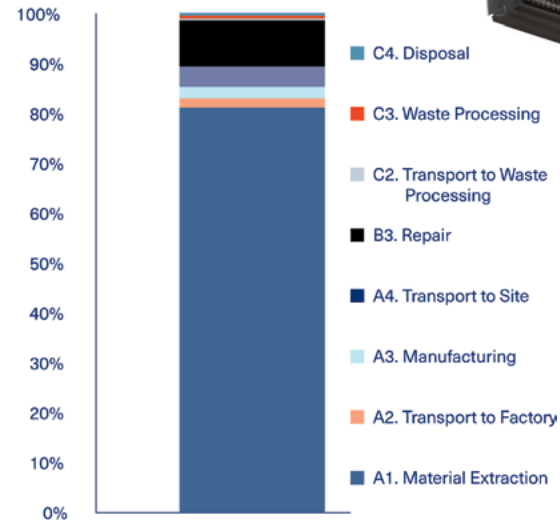
Results			
Life Cycle Stage	Results per-unit (kg CO2-eq)	Results per-kg product weight (kg CO2-eq)	Notes
A1. Material Extraction	61.0	2.77	Material emission factors sourced from TM65:2021 table 2.1 and TM65NA:2024 table 2.1. Greater than 95% of material composition accounted for. Assumed steel for any weight unaccounted for in raw material composition.
A2. Transport to Factory	1.4	0.06	Calculated based on average transport distance from supplier to factory location. Transport emission factors from TM65NA: 2024 table 2.4.
A3. Manufacturing	1.7	0.08	Electricity Carbon Factor for RFCW eGRID region from TM65NA:2024 table 2.6. Gas carbon factors from TM65NA:2024 table 2.10. As per TM65NA:2024 table 2.5, assumed 4 rounds of manufacturing.
A4. Transport to Site	3.1	0.14	Calculation based on avg. transport distance to customer sites over past 3 years. Transport emission factors from TM65NA: 2024 table 2.4.
B1. Use (Refrigerant Leakage During Product Life)	-	-	Not applicable, no refrigerant in product.
B3. Repair	6.8	0.31	TM65:2021 assumption, Table 4.6, value is 10% of A1-A4 + 10% of C2-C4
C1. Deconstruction (Refrigerant Leak at End of Product Life)	-	-	Not applicable, no refrigerant in product.
C2. End of Life Transport	0.3	0.01	Per TM65NA:2024 Table 2.5, assumed transport of 100 km by truck. Transport emission factors from TM65NA: 2024 table 2.4.
C3. Waste Processing	0.4	0.02	Per TM65:2021 Table 4.7, assumed processing energy use equal to one round of manufacturing energy use from A3. Manufacturing.
C4. Disposal	0.3	0.01	Assumed 85% of metals in product recycled, other materials sent to landfill. Sourced landfill emission factor from TM65NA:2024 table 2.13.
Embodied carbon without refrigerant leakage			
A1-C4 (excluding B1, C1)	75.1	3.41	
A1-C4 with buffer factor (excluding B1, C1)	97.7	4.44	1.3 buffer factor per TM65:2021
Refrigerant leakage only			
B1 + C1	-		
Total Embodied Carbon			
All life cycle stages, without buffer factor	75.1		
All life cycle stages, with buffer factor	97.7		

## Product Details

**Model:** VariTrane® Single Duct Terminal VAV Unit

**Unit Weight** (shipping weight unless otherwise specified): 22 kg

**Manufacturing Location:** Rushville, IN



## Other Data, Details, Notes

**TM65 Complexity Category:** Category 3: High Complexity

**Repair and replacement rate per TM65NA:2024:** 10%

This calculation was performed for a selected unit configuration and size. It is reasonable to assume that the per-kg product weight results can be extrapolated to all sizes in the model range, using each unit's respective shipping weight, given similarities in raw materials, manufacturing, supply chain, and end of life. However, *it is recommended to perform bespoke refrigerant leakage calculations for each different size using the refrigerant charge amounts listed in the product manual.*



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