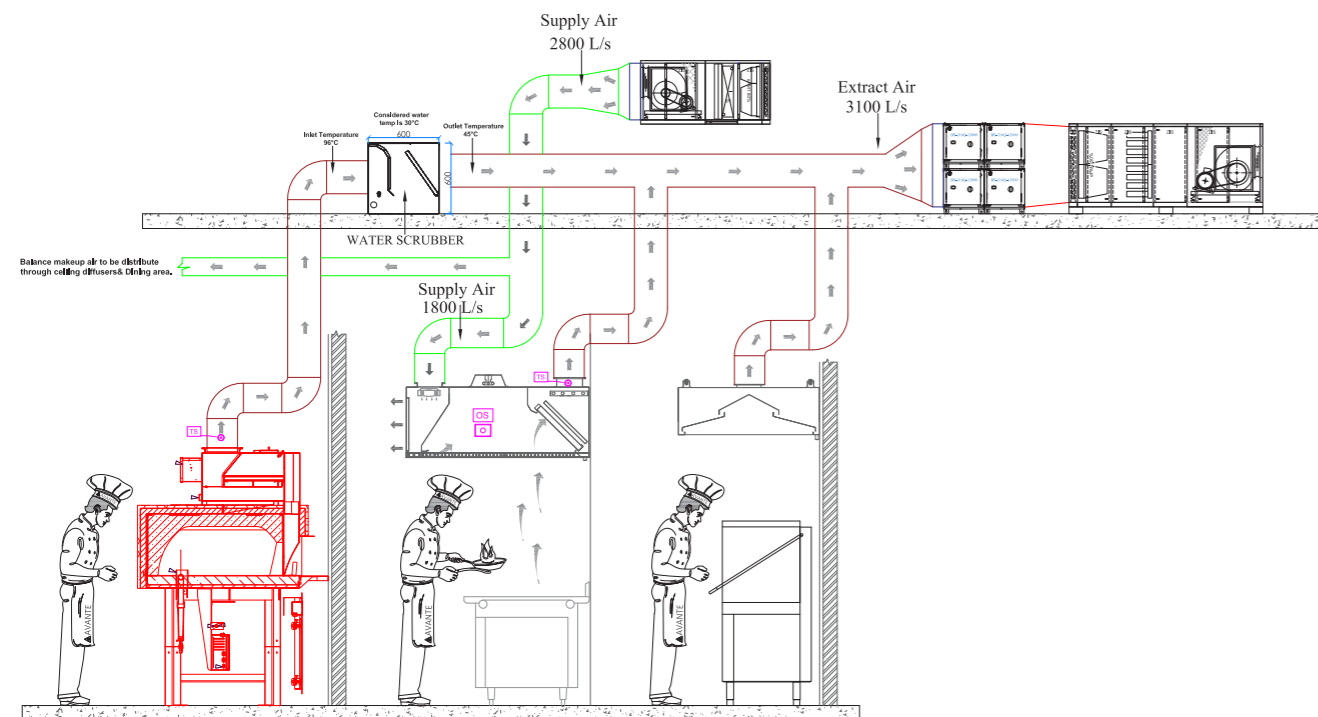


HVAC

Avante offers its customers a high quality and energy efficient HVAC system that provides several benefits:

- **Improved indoor air quality:** Our HVAC system helps provide ventilation and air filtration to improve the air quality inside the kitchen
- **Increased Comfort:** Our HVAC system contributes to maintaining a comfortable indoor temperature year-round which improves the productivity and the well-being of the kitchen operators
- **Energy Saving:** Regular maintenance of the HVAC system helps save energy, reducing costs and carbon footprint emissions
- Our modular components are assembled to match each project specific configuration



HVAC SYSTEM

I. ECOLOGY UNIT

- Avante high efficiency ecology unit comes complete with:
 - electrostatic precipitator sections
 - Filtration section
 - Fan section
 - VFD control panel
- Capacities range from 2,000 CFM to 20,000 CFM
- Our modular components are assembled to match each project specific configuration



SIZES

Avante Ecology Unit is offered in diverse sizes and capacities to adapt to the specific requirements in terms of flow rates.

AVANTE STANDARD ECOLOGY UNIT				
REF	Flow rate in CFM	ESP in Pa	Overall dimensions (LxWxH)	Weight in KG
1	2 000	1500	5408 x 1165 x 970	465
2	3 000	1500	5408 x 1320 x 970	528
3	4 000	1500	5408 x 1625 x 970	674
4	5 000	1750	5468 x 1516 x 1054	775
5	6 000	1750	5522 x 1625 x 1145	821
6	8 000	1750	5602 x 1625 x 1350	939
7	10 000	1750	5672 x 2194 x 1399	1108
8	12 000	1750	5672 x 2235 x 1399	1389
9	15 000	1750	5822 x 2235 x 1865	1775
10	18 000	1750	5822 x 2235 x 1960	1993
11	20 000	1750	5902 x 2540 x 1980	2796

ELECTROSTATIC PRECIPITATOR - ESP

FEATURES:

- Offered with intelligent power supply panel with fault indicator light for users to understand the status with RS485 transmission facility
- Equipped with an efficient exhaust purification technology with sawtooth ionization technique, large dust collection area, high conductivity aluminum material and PWM power board
- Uses a Safe Fire-Proof Technique with tracking resistance solution, oil guide system and smart power-off technique
- Offers industry leading core technology-glow ionization efficient purification corona discharge which compromises corona inception, glow ionization, streamer ionization and spark discharge

COMPONENTS

A. CASING AND PANELS

Avante offers a unique casing construction with double skinned panels.

The casing is assembled with self-supporting structure modular panel elements with integrated base frame made of galvanized steel and coated aluminum profile.

GI sheets of 1.0 mm thickness with white PVC coating for both inner and outer skin is used. Inner skin is coated with anti-microbial coating and tested as per ASTM G21.

B. FILTERS

Based on the customer requirements and design, we can offer the bellow filter combination:

STAGE 1: PLEATED FILTER

- 2" (51mm)
- Rated at 40% ASHRAE std 52.1, UL 900 Class 2 rating

STAGE 2: DEEP BAG FILTER

- 20" (508mm)
- Rated at 90-95% ASHRAE std 52.1, UL 900 Class 2 rating

STAGE 3: ABSOLUTE FILTER (HEPA) *OPTIONAL

- 12" (305mm)
- UL/ULC
- Rated at 95% DOP to 0.3 microns and have a locking device to ensure zero air bypass

STAGE 4: CARBON FILTER

- Canister type
- Deep bed type

The system shall consist of multiple individual canisters in metal execution. The canister shall be assembled in a galvanized sheet metal holding frame to fit the standard dimension of the filter sections as part of the ecology unit.

The canisters shall be factory pre-filled with user-specific media. Each canister shall be vibration filled to ensure that the media is uniformly packed.

C. EXTRACT FAN

- UL certified
- Radial fan with belt drive
- Plug fan
- TEFC three phase motor, conform to IEC standard, Single speed or two speed
- Isolator switch
- Belt guard protection / grid for inspection door

D. CONTROL PANEL

Includes:

- Circuit breaker
- Motor protection switch
- Terminal block for main supply or external components
- Circuit breaker for electrostatic filter
- Filter pressure drop monitoring

CERTIFICATIONS:

Our ESP are tested and certified:

- By LMS technologies, INC, USA
- For ASHRAE Test Standard 52.2-2017
- MERV 16 Filtration Capacity
- UL certified

OPTIONS:

- With / Without autowash
- With / Without UL certification



ELECTROSTATIC PRECIPITATOR MODELS

AVE-A SERIES

KITCHEN ELECTROSTATIC PRECIPITATOR WITH AUTOWASH SELF CLEANING SYSTEM.

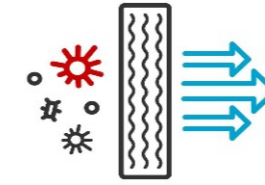
Methylbenzene
Oil fumes / Grease
Smoke



Smoke free
Oil & Grease free
Clean air



A self-cleaning (auto-wash) kitchen exhaust purifier with water / detergent system (detergent tank with pump) added to the Electrostatic Precipitator, combined with the cleaning control system (Intelligent Wash Control Panel), to achieve deep flushing inside the equipment. This ideal Self-Cleaning Purifier helps in management of the Electrostatic Precipitator maintenance for busy commercial kitchens where time is a key factor.



EFFICIENT PURIFICATION

With two-segment jagged plates ionization technology employed, the purification efficiency can be up to 97%. The lower the face velocity of air, the higher is the purification effect.



ESP CASING

The outer ESP casing is completely welded 16-gauge Fe-Zn coated steel with anti UV paint by electrostatic spraying for excellent corrosion resistance. The complete casing is tested and rated with ingress protection of IP54. The direction of the access door can be adjusted as per the site requirement just by reversing the cell direction and electrical connection, thus facilitating the installation at site without any concern for the access door location.



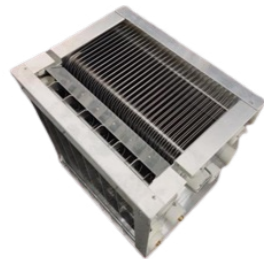
AUTOWASH SYSTEM

Detergent, hot wash and rinse water are applied by fixed nozzle system mounted on the top of the cell having 5 nozzles per cell for complete access and thorough cleaning of all the collector plates. The detergent and water are applied through Stainless Steel manifolds & spray nozzles, producing a positive fan shaped spray pattern. The wash system is designed to operate with 140°F/44 psi hot water supply.

ELECTROSTATIC PRECIPITATOR MODELS

AVE-A SERIES

KITCHEN ELECTROSTATIC
PRECIPITATOR WITH AUTOWASH
SELF CLEANING SYSTEM.



CELL CONSTRUCTION

The ESP cell and collection plates are constructed from aviation grade aluminum featuring high conductivity, 4 times higher than the Stainless Steel. Conductivity is a key factor which affects collection efficiency. The distance between the collection plates is small to capture very fine particles of size up to $0.3\mu\text{m}$. The depth of the collection plate is more thus increasing the surface area of the collection section increasing the dirt adsorption and holding capacity. This also ensures dirt particles do not escape from the collection area without being captured. Long-lasting Stainless-Steel spike ionizer for 4-point discharge double ionization with saw tooth design. Each saw teeth can independently generate coronas and can supplement and enhance each other. Thus, under the same voltage conditions, the corona strength can be reinforced, improving equipment's purification efficiency.

POWER SUPPLY

PWM smart power board to ensure stable output voltage irrespective of the fluctuations in the input voltage which avoids arc discharge resulting in high and steady purification efficiency. Power Supply is 100% solid state type mounted out of the airstream in a separate control box on the ESP door. The input power is 220 Volts / 1 Ph / 50/60 Hz. High voltage output of (-) 13.5 KVDC for the ionizer and (-) 7 KVDC for the collector with built in short circuiting and arc protection.



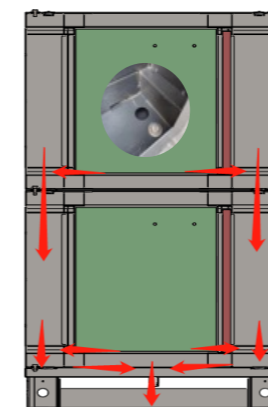
DOOR SAFETY FEATURES

Nested double door design for increased safety. The outer door encloses electrical connections while the inner door provides access to the ESP cell for cleaning and maintenance. The unit is provided with door operated electrical safety interlock switch which disconnects the primary input power supply when door is opened, to prevent access to the high voltage collector cells, and can be switched on only once the door is closed.



CERAMIC INSULATORS

The ESP cells have high voltage insulators molded from self-glazing ceramic with long and stable insulation performance, having radial and bilateral symmetry, contains no high voltage penetrations and do not expose high voltage on the process air side.



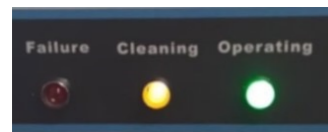
MODULAR CONSTRUCTION WITH OIL-GUIDE SYSTEM

The Electrostatic Precipitators are modular design construction to stack multiple units of the same model either horizontally or vertically for higher airflow capacities. Each ESP unit is provided with an oil guide system. When stacked vertically, the oil discharged from the upper units will be guided into the oil conduit to flow downwards, rather than dripping directly into the collector section of the units, mounted underneath. The oil is finally discharged from the bottom unit either into the drain pan (optional accessory) or the drainpipe (standard) to be connected to the oil drain.

ELECTROSTATIC PRECIPITATOR MODELS

AVE-A SERIES

KITCHEN ELECTROSTATIC PRECIPITATOR WITH AUTOWASH SELF CLEANING SYSTEM.



RS 485

PANEL MOUNTED INDICATORS & REMOTE SIGNALS

The Electrostatic Precipitators are provided with 3 indicators on the face of the unit panel for “RUN / FAULT / MAINTENANCE (CLEANING)” status. The unit is equipped to provide RS 485 signals for stable long-distance transmission of the above-mentioned status to the Building Management System (BMS). The unit also has provision for dry contacts (voltage free contacts) for remote status monitoring.



INTELLIGENT WASH CONTROL PANEL

The Intelligent Wash Control Panel (Sequence Controller) is solid-state user-friendly type housed in an enclosure. The wash panel is provided with factory pre-set wash sequence having timer to set the wash cycle time as per the client's requirement at site. The wash cycle can be programmed for any time in a 24*7 clock system, as per the convenience at site. The intelligent Control Panel provides automatic power-off / cleaning / drying / power-on / alarm in time-sharing functions. The wash control panel has inter-connections for system fan shut down during wash cycle.

Programmable Logic Control Auto-wash control panel for wash sequence can be provided as optional.

One Auto-wash System (Detergent Tank + Pump + Intelligent Wash Control Panel) can control 3 to 4 units mounted in stacking as a single system.



DETERGENT TANK & PUMP

The detergent dispensing assembly consists of 120 liters reservoir (anti-corrosive), pump and motor and flow volume control valve. The positive displacement pump delivers 25 LPM at 3 bar pressure suitable for maximum 40 mts. pipe length. Motor is 800 Watts suitable for 200-240 VAC, 50/60 Hz, 1 Ph.

Electric Solenoid Valve & Wye Strainer are not included in the above system but can be supplied as optional accessories.



DRAIN PAN

Epoxy Coated Steel Drain Pan collects the grease, oil, detergent, and water during the wash cycle and drains it through the drain port. The V-Shaped inclined drain pan design helps in optimizing the drainage speed.



POST FILTER

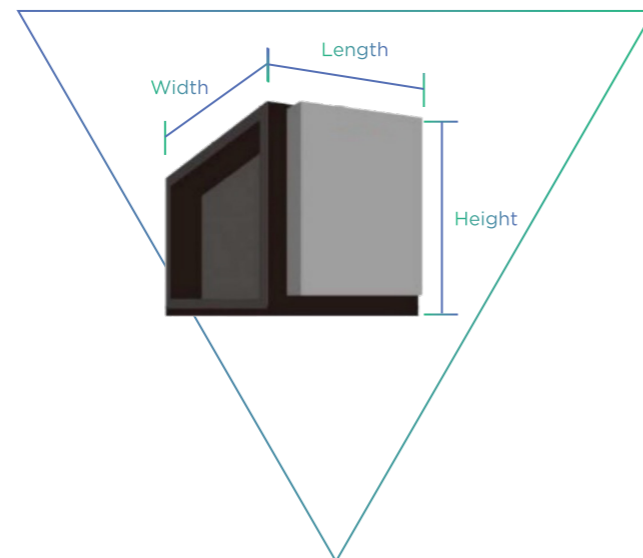
18 mm thick post-Filter, constructed of triple layer aluminum diamond mesh is mounted to contain wash water overspray.

ELECTROSTATIC PRECIPITATOR MODELS

AVE-A SERIES KITCHEN ELECTROSTATIC PRECIPITATOR WITH AUTOWASH SELF CLEANING SYSTEM.

TECHNICAL PARAMETERS

Parameters	Models	AVE-6000-A	AVE-7500-A	AVE-12000-A	AVE-15000-A	AVE-20000-A	AVE-22500-A
Efficiency ≥90%	Airflow (cfm)	3550	4400	7060	8800	11800	13200
	Pressure (Pa)	150	120	150	120	150	120
Efficiency ≥95%	Airflow (cfm)	2550	2750	4700	5500	7700	8200
	Pressure (Pa)	82	55	82	55	82	55
Dimensions (LxWxH) mm		560x900x850	560x955x850	560x1575x850	560x1680x850	560x2250x850	560x2410x850
Electrical Power Input		220-240 V / 1 Phase / 50-60 Hz					
Rated Power (W)		95	110	200	225	280	320
Equipment Weight (Kgs)		90	100	150	160	210	230
Water Supply Flow Rate (l/min) @ ≥ 3 Bar		15.5	15.5	31	31	46.5	46.5
Water Consumption (L)		45	45	95	95	140	140
Detergent Consumption (L)		1.4	1.4	2.8	2.8	4.2	4.2
NOTE	A minimum clearance of 1050 mm is required at the access door for cell removal & maintenance						



A. PIPE CONNECTION DETAILS

- Inlet Pipe Connection (G Thread): DN20 (3/4") External Thread
- Drainpipe Connection (G Thread): DN80 (3") External Thread

DETERGENT TANK & PUMP DETAILS



Dimensions (L x W x H mm)	410 x 540 x 1120
Installation	Suspended, Platform or Frame for Pipe Installation
Base Height (mm)	180
Tank Capacity (L)	120
Pump Rated Power (Watts)	800
Outlet Pipe Interface	DN15 Internal Thread
Assembly Weight	Empty 35 Kgs.; Full 155 Kgs.

INTELLIGENT WASH CONTROL PANEL DETAILS



Dimensions (L x W x H mm)	532 x 210 x 482
Control Box Functions	Power Off for ESP & Interconnected Fan during Washing Cycle, Automatic Washing, Blow Drying, Auto Power-On after Wash Cycle, Alarm, Remote Signal Output for BMS
Auto Wash Timing	24*7 Adjustable Clock - Setting at Site as per Client's Requirement
Control Output	AVE-A Unit, Detergent Pump & Solenoid Valve
Input Power	220-240 V / 1 Phase / 50-60 Hz
Panel Weight (Kgs.)	20

ELECTROSTATIC PRECIPITATOR MODELS

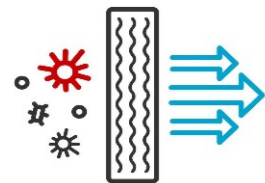
AVE-M SERIES

KITCHEN ELECTROSTATIC PRECIPITATOR (MANUAL)

Methylbenzene
Oil fumes /
Grease Smoke



Smoke free
Oil & Grease free
Clean air



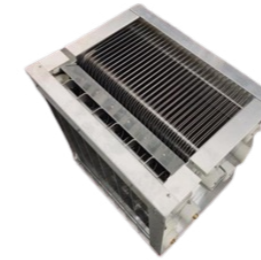
EFFICIENT PURIFICATION

With two-segment jagged plates ionization technology employed, the purification efficiency can be up to 97%. The lower the face velocity of air, the higher is the purification effect.



ESP CASING

The outer ESP casing is completely welded 16-gauge Fe-Zn coated steel with anti UV paint by electrostatic spraying for excellent corrosion resistance. The complete casing is tested and rated with ingress protection of IP54. The direction of the access door can be adjusted as per the site requirement just by reversing the cell direction and electrical connection, thus facilitating the installation at site without any concern for the access door location..



CELL CONSTRUCTION

The ESP cell and collection plates are constructed from aviation grade aluminum featuring high conductivity, 4 times higher than the Stainless Steel. Conductivity is a key factor which affects collection efficiency. The distance between the collection plates is small to capture very fine particles of size up to $0.3\mu\text{m}$. The depth of the collection plate is more thus increasing the surface area of the collection section increasing the dirt adsorption and holding capacity. This also ensures dirt particles do not escape from the collection area without being captured. Long-lasting Stainless-Steel spike ionizer for 4-point discharge double ionization with saw tooth design. Each saw teeth can independently generate coronas and can supplement and enhance each other. Thus, under the same voltage conditions, the corona strength can be reinforced, improving equipment's purification efficiency.



POWER SUPPLY

PWM smart power board to ensure stable output voltage irrespective of the fluctuations in the input voltage which avoids arc discharge resulting in high and steady purification efficiency. Power Supply is 100% solid state type mounted out of the airstream in a separate control box on the ESP door. The input power is 220 Volts / 1 Ph / 50/60 Hz. High voltage output of (-) 13.5 KVDC for the ionizer and (-) 7 KVDC for the collector with built in short circuiting and arc protection.

ELECTROSTATIC PRECIPITATOR MODELS

AVE-M SERIES

KITCHEN ELECTROSTATIC PRECIPITATOR (MANUAL)



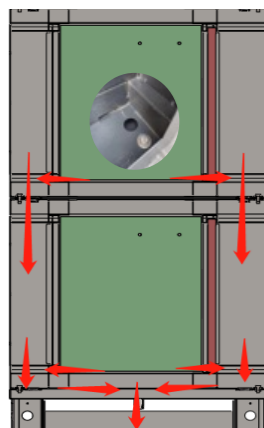
DOOR SAFETY FEATURES

Nested double door design for increased safety. The outer door encloses electrical connections while the inner door provides access to the ESP cell for cleaning and maintenance. The unit is provided with door operated electrical safety interlock switch which disconnects the primary input power supply when door is opened, to prevent access to the high voltage collector cells, and can be switched on only once the door is closed.



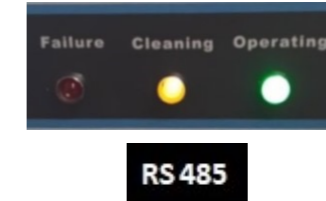
CERAMIC INSULATORS

The ESP cells have high voltage insulators molded from self-glazing ceramic with long and stable insulation performance, having radial and bilateral symmetry, contains no high voltage penetrations and do not expose high voltage on the process air side.



MODULAR CONSTRUCTION WITH OIL-GUIDE SYSTEM

The Electrostatic Precipitators are modular design construction to stack multiple units of the same model either horizontally or vertically for higher airflow capacities. Each ESP unit is provided with an oil guide system. When stacked vertically, the oil discharged from the upper units will be guided into the oil conduit to flow downwards, rather than dripping directly into the collector section of the units, mounted underneath. The oil is finally discharged from the bottom unit either into the drain pan (optional accessory) or the drainpipe (standard) to be connected to the oil drain.

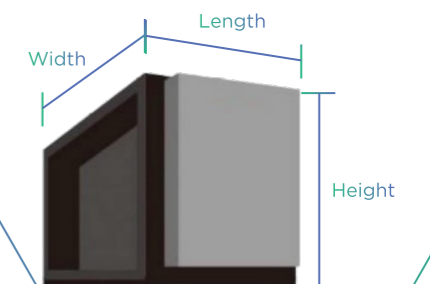


PANEL MOUNTED INDICATORS & REMOTE SIGNALS

The Electrostatic Precipitators are provided with 3 indicators on the face of the unit panel for "RUN / FAULT / MAINTENANCE (CLEANING)" status. The unit is equipped to provide RS 485 signals for stable long-distance transmission of the above-mentioned status to the Building Management System (BMS). The unit also has provision for dry contacts (voltage free contacts) for remote status monitoring.

TECHNICAL PARAMETERS

Parameters	Models	AVE-6000-M	AVE-7500-M	AVE-12000-M	AVE-15000-M	AVE-20000-M	AVE-22500-M
Efficiency $\geq 90\%$	Airflow (cfm)	3550	4400	7060	8800	11800	13200
	Pressure (Pa)	150	120	150	120	150	120
Efficiency $\geq 95\%$	Airflow (cfm)	2550	2750	4700	5500	7700	8200
	Pressure (Pa)	82	55	82	55	82	55
Dimensions (L x W x H) mm		560x840x835	560x900x835	560x1515x835	560x1630x835	560x2195x835	560x2360x835
Electrical Power Input		220-240 V / 1 Phase / 50-60 Hz					
Rated Power (W)		95	110	200	225	280	320
Equipment Weight (Kgs)		70	80	115	125	170	180
NOTE		A minimum clearance of 1050 mm is required at the access door for cell removal & maintenance					



HVAC SYSTEM

II. AIR HANDLING UNIT - FAHU - AHU

Our FAHU / AHU units stand out for their remarkable flexibility and are Eurovent-certified. The units can be tailored to suit customer specific needs with freely configurable unit systems and a diverse selection of high-quality components.

SPECIFICATIONS:

- 50 mm double-walled casing
- Sheet thicknesses : up to 1.5 mm sheet metal
- Non-flammable mineral wool with a density up to 150 kg/m³
- Casing data (MB ZHK INOVA) according to EN 1886 certified:
 - Mechanical casing strength: Class D1(M)
 - Casing leakage at -400 Pa: Class L1(M)
 - Casing leakage at +700 Pa: Class L1(M)
 - Filter bypass leakage: Class F9 (M)
 - Heat transmission: Class T2
 - Thermal bridging factor: Class TB2

