

ERDİNÇ KLİMA ENDÜSTRİ ÜRÜNLERİ SAN.TİC.LTD.ŞTİ.
2018

FES KLİMA

INDUSTRIAL EVAPORATIVE COOLING UNITS

CUMHURİYET MAH SÖĞÜTLÜÇAYIR CAD. 89 A ÜSKÜDAR/ İSTANBUL

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HIGH EFFICIENT ECONOMIC COOLING AT ALL LOCATION AND ALL GEOGRAPHY

- Increase of business efficiency: Human productivity falls by 4% for every degree over 22°C. FES units (Evaporative cooling units) increases human productivity with high volume cold air.

- Practical Solution: Quick installation, direct blow or air distribution with air duct.

- Low cost operation: No compressor, no cooling gas, no complicated parts.

- High Efficiency: Cooling pads are original Munters CELdec, with very high efficiency and long life.

- Economical Investment: The capital cost is 80% less than the conventional industrial air conditioning system.

- High Indoor Air Quality: 100% fresh air, natural filtration.

- Nature Friendly: No refrigerant, no contaminant, low energy consumption.

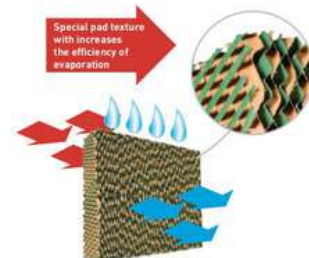
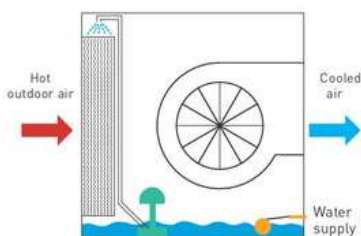
- Long life: Stainless steel or plastic casing.



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WHAT IS EVAPORATIVE COOLING?

Evaporative cooling is the addition of water vapor into air, which causes a lowering of the temperature of the air. The energy needed to evaporate the water is taken from the air in the form of sensible heat, which affects the temperature of the air, and converted into latent heat, the energy present in the water vapor component of the air, whilst the air remains at a constant enthalpy value. This conversion of sensible heat to latent heat is known as an adiabatic process because it occurs at a constant enthalpy value.

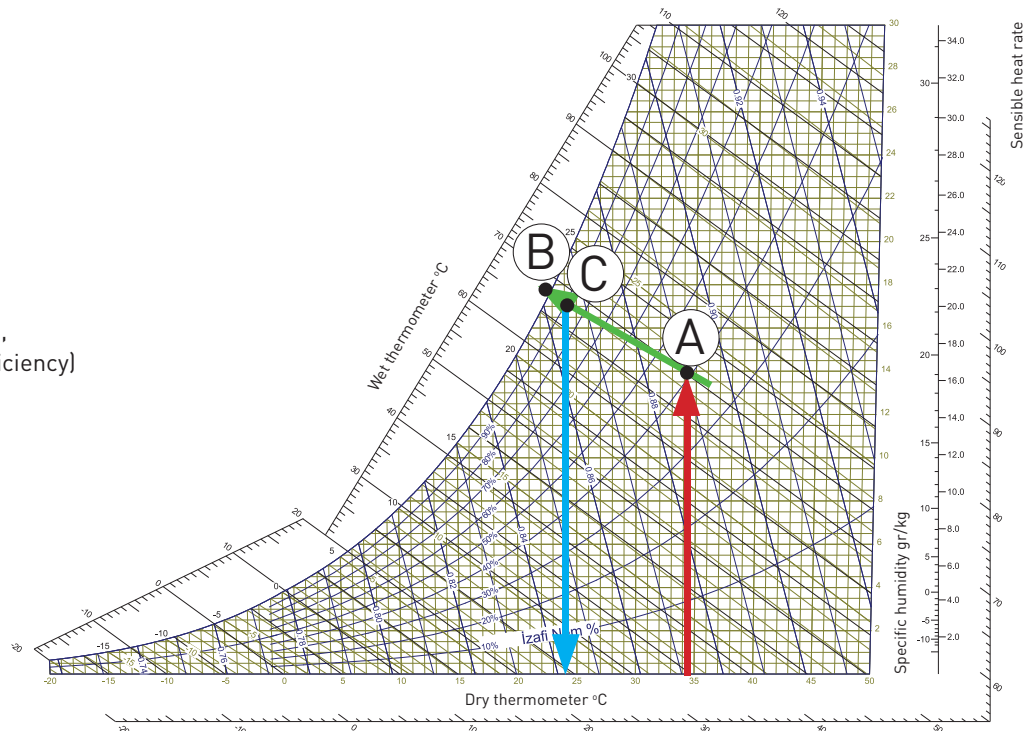


Evaporative cooling therefore causes a drop in the temperature of air proportional to the sensible heat drop and an increase in humidity proportional to the latent heat gain. Evaporative cooling can be visualized using a psychrometric chart by finding the initial air condition and moving along a line of constant enthalpy toward a state of higher humidity. A simple example of natural evaporative cooling is perspiration, or sweat, secreted by the body, evaporation of which cools the body.

Work Technic:

A : Outside Air
 B : 100% efficient evaporation
 C : Blowing Air (24,2°C, 79% humidity),
 [80% with pad efficiency]

$\Delta t = 10,8^{\circ}\text{C}$



Blowing temperature calculation Formula

$$T_c = T_{kt} - [(T_{kt} - T_{yt}) \times \text{pad efficiency}]$$

- T_c : Air temperature exiting
- T_{kt} : Outside air temperature
- T_{yt} : Wet thermometer temperature

Blowing temperature example:

- T_{kt} : Outside air temperature = 40 °C
- T_{yt} : Wet thermometer temperature = 22°C (%20 RH)
- Pad efficiency: 80%
- T_c : Air temperature exiting

$$T_c = T_{kt} - [(T_{kt} - T_{yt}) \times \text{pad efficiency}]$$

$$T_c = 40 - [(40 - 22) \times 0,80]$$

$$T_c = 25,6^{\circ}\text{C} (\Delta t = 14,4^{\circ}\text{C})$$

Blowing temperatures

		Outside relative humidity									
		%15	%20	%25	%30	%35	%40	%45	%50	%55	%60
Outside temperature	30°	16,5°	17,5°	18,5°	19,5°	20,5°	21,5°	22,5°	23,0°	24,0°	24,5°
	35°	20,0°	21,0°	22,5°	23,5°	24,5°	25,5°	26,5°	27,5°	28,5°	29,0°
	40°	23,5°	25,0°	26,0°	27,5°	28,5°	29,5°	31,0°	32,0°	33,0°	33,5°
	45°	27,0°	28,5°	30,0°	31,0°	32,5°	33,5°	35,0°	36,0°	37,0°	38,0°
	50°	30,0°	32,0°	33,5°	35,0°	36,0°	37,5°	39,0°	40,0°	41,0°	42,0°

This table is a sample. Data may change according to unit model

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STAINLESS STEEL RADIAL FAN UNITS



Specifications

- Stainless Steel
- Voltage and surge protection electric motors. (electric motors: IP56, long life)
- Fan flow with inverter controller (optional)
- The unit has the highest pad area and it is most efficient unit in the market
- Automatic timed drainage system
- LCD panel control (optional)
- Radial fan, stainless steel roller, custom painted
- Ozone generator for high hygiene requirements (optional)
- 4G cartridge filters in front of the pads for filter inlet air.
- Pads are located in a special extruded aluminium frame. It is easy to insert or remove.

Model	FES35-RCB FES35-RCT FES35-RCS	FES20-RCB FES20-RCT FES20-RCS	FES16-RCB FES16-RCT FES16-RCS
Air flow (m ³ /h)	35000	20.000	16.000
Pressure (Pa)	350	250	250
Fan speed	1 Speed Level	1 Speed Level	1 Speed Level
Power (kW)	5.5	5.5	2.2
Voltage (V)	380	380	380
Fan type	Radial	Radial	Radial
Water tank (l)	150	80	80
Dimensions (mm)	1600x1600x1800	1200x1150x1285	1200x1150x1285
Air Outlet Sizes (mm)	715x715	560x480	560x480
Pad Area (mm)	7,20	3,52	3,52
Control	LCD Panel (optional)	LCD Panel (optional)	LCD Panel (optional)
Cleaning Function	Automatic	Automatic	Automatic
Dust Prefilter	G4 (optional)	G4 (optional)	G4 (optional)
Ozone Hygiene System	Optional	Optional	Optional
Water Inlet	½"	½"	½"
Drainage	1"	1"	1"
Net Weight (kg)	430	182	152
Operating Weight (kg)	580	262	222

- RCB – bottom discharge
- RCT – top discharge
- RCS – side discharge

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PLASTIC UNITS

WITH RADIAL FAN



Specifications

- Long life plastic case. 10 years warranty.
- Voltage and surge protected electric motors. (IP56, long life)
- Optional fan flow with inverter controller
- The unit has the highest pad area and it is most efficient unit in the market
- For bottom blowing, the outlet of this unit is compatible with the circular and the rectangular duct.
- Automatic timed drainage system
- LCD panel control (optional)
- Radial fan, stainless steel roller, custom painted
- Ozone generator for high hygiene requirements (optional)
- There are cartridge filters in front of the pads for filter inlet air. Easy to clean up. No need to change.
- Provides maximum cooling with highly efficient pads and highest pad area.

Model	FES10-RPB FES10-RPS	FES16-RPB FES16-RPS	FES20-RPB FES20-RPS
Air flow (m ³ /h)	10000	16000	20000
Pressure (Pa)	150	200	250
Fan speed	1 Speed Level	1 Speed Level	1 Speed Level
Power (kW)	1.5	2.2	5.5
Voltage (V)	380	380	380
Fan type	Radyal	Radyal	Radyal
Water tank (l)	60	60	60
Dimensions (mm)	1300x1300x1400	1300x1300x1400	1300x1300x1400
Air Outlet Sizes (mm)	800x800 / Ø710	800x800 / Ø710	800x800 / Ø710
Pad Area (m ²)	3,83	3,83	3,83
Control	LCD Panel	LCD Panel	LCD Panel
Cleaning Function	Automatic	Automatic	Automatic
Dust Prefilter	Cartridge Type	Cartridge Type	Cartridge Type
Ozone Hygiene System	Optional	Optional	Optional
Water Entrance	½"	½"	½"
Drainage	1"	1"	1"
Net Weight (kg)	155	180	180
Operating Weight (kg)	215	240	240

- RPB – bottom discharge
- RPT– top discharge

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PLASTIC UNITS

WITH AXIAL FANS



Specifications

- Long life plastic case. 10 years warranty.
- Voltage and surge protection electric motors (electric motors: IP56, long life and aluminium casin)
- Fan flow is with inverter controller
- The unit has the highest pad area and it is most efficient unit in the market (for 25.000 and 30.000 m3/h)
- The outlet of this unit is compatible with the circular and the prismatic duct.
- Include automatic timed drainage system
- Control with LCD touch panel or remote control
- Special axial fan like the propeller type.
- Optional ozone generator for high hygiene requirements
- There are cartridge filters in front of the pads for filter inlet air. Easy to clean up. No need to change.
- Provides maximum cooling with highly efficient pads and highest pad area.

Model	FES20-APB FES20-APT	FES25-APB FES25-APT	FES30-APB FES30-APT
Air flow (m ³ /h)	20000	25000	30000
Pressure (Pa)	180	200	300
Fan speed	9 Speed Level	6 Speed Level	6 Speed Level
Power (kW)	1.5	2.2	3.0
Voltage (V)	220	380	380
Fan type	Axial	Axial	Axial
Water tank (l)	30	60	60
Dimensions (mm)	1160x1160x1120	1300x1300x1400	1300x1300x1400
Air Outlet Sizes (mm)	670x670 / Ø630	800x800 / Ø710	800x800 / Ø710
Pad Area (m ²)	2,10	3,83	3,83
Control	LCD Panel	LCD Panel	LCD Panel
Cleaning Function	Automatic	Automatic	Automatic
Dust Prefilter	Cartridge Type	Cartridge Type	Cartridge Type
Ozone Hygiene System	Optional	Optional	Optional
Water Entrance	½"	½"	½"
Drainage	1"	1"	1"
Net Weight (kg)	60	100	100
Operating Weight (kg)	90	160	160

- APB – bottom discharge
- APT– top discharge

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WALL TYPE EXHAUST FAN



- In case of desired to change inner place moisture and using of Evaporative cooling, the amount of moisture entered air will be balanced and providing constant circulation. Wall type extraction fans are the ideal exhaust fan when ever extra high air flow capacity is required. It can also be used with evaporative coolers to exhaust the humid air and to balance the air inside.

• Specification

- High capacity, automatic mechanic damper

Model	Flow (m ³ /h)	Motor Power (kW)	Voltage (V)	Dimensions (mm) (HxWxL)
EM-36	19,880	0.75	380	1090x1090x450
EM-50	40,800	1.5	380	1380x1380x450



RADIAL FAN UNITS CONTROL SYSTEMS



- Properties of control panel designed for radial fan models:
 - Connectable to building automation.(RS485)
 - It is possible to control up to 16 units in same time with 1 control panel.
 - The unit starts and stops automatically with the time settings.
 - The unit can be operated according to entered set points for temperature and humidity.
 - There is time-controlled automatic drainage system. Also drain with manually can be provided.
 - Thanks to “hygiene” function, the unit makes its own cleaning when it is turn off.
 - Dosage Pump; the water inside of the system can be conditioned.(optional)
 - PPM sensor; the drainage starts automatically when the water is contaminated.(optional)
 - The fan speed can be controlled by adding inverter. (optional)

AXIAL FAN UNITS CONTROL SYSTEMS



- Properties of control panel designed for axial fan models:
 - Fan speed can be controlled by inverter.
 - There is time-controlled automatic drainage system. Also drain with manually can be provided.
 - Automatic drainage system prevents bacterial formation.
 - Thanks to “exhaust” property , the unit can be work as a exhaust fan.
 - The unit starts its function automatically according to entered set points for temperature and humidity.
 - The water level in the tank can be monitored form the control panel screen.
 - The unit starts and stops automatically with the time settings.

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OPTIONAL

ACCESSORIES

Ozone Technology

The most effective natural disinfectant against microbes.
Provides hygiene in water, and eliminate bad smell.



- Ozone is a very powerful oxidizer. In the water, it is used to eliminate bad smell, microbes and many organic molecules that pollute the environment. The Ozone, also, is a very powerful disinfectant. It provides a healthy area. It is completely natural it is a very powerful disinfectant. It is not a chemical component and there will be no residue. When we compare with the other disinfectant which have repercussions, Ozone which is a natural cycle is more healthy and more effective.

Fes Klima Anti-scale Tablet

This is a special tablet which is seasonally and reduces calcification in pad and unit. Therefore, the pad and the unit life extends and cooling efficiency always remains high.



Fes Klima 8-way Diffuser

Manufactured from long life ABS. Reducing the roof load, it is a very light and effective for air distribution. The blowing direction could be regulated. With 8 pieces aluminium vents, it provides homogeneous air distributing.



Standard Features (for Axial fan units)



LCD Control Panel

Multi-speed inverter control,
on/off option according to
humidity value



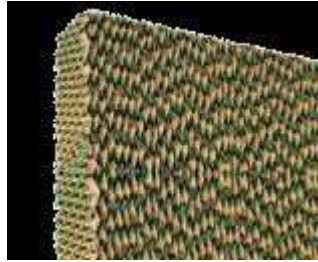
Motorized Drain Valve

Automatic and manual control



Air Filter

Sliding, in particular slot,
provides protection against
dust, flies, etc.



Wet pad

Long life, cellulosic pad



Aluminium Motor

Voltage protection,
Aluminium case, IP-65 long
life motor



Fan

Special designed
propellerHigh flowHigh
pressure



Pump

Special design, self filter,
high speed and pressure



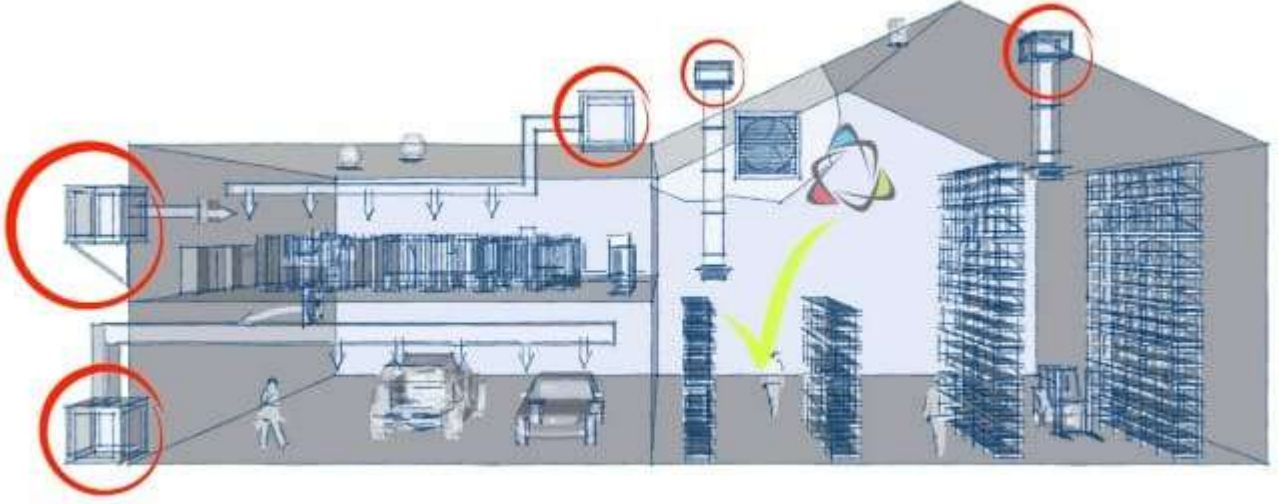
Case

Low solar absorption light
color caseABS powerful
body10 years warranty (case
only)

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INSTALLATION FIGURES

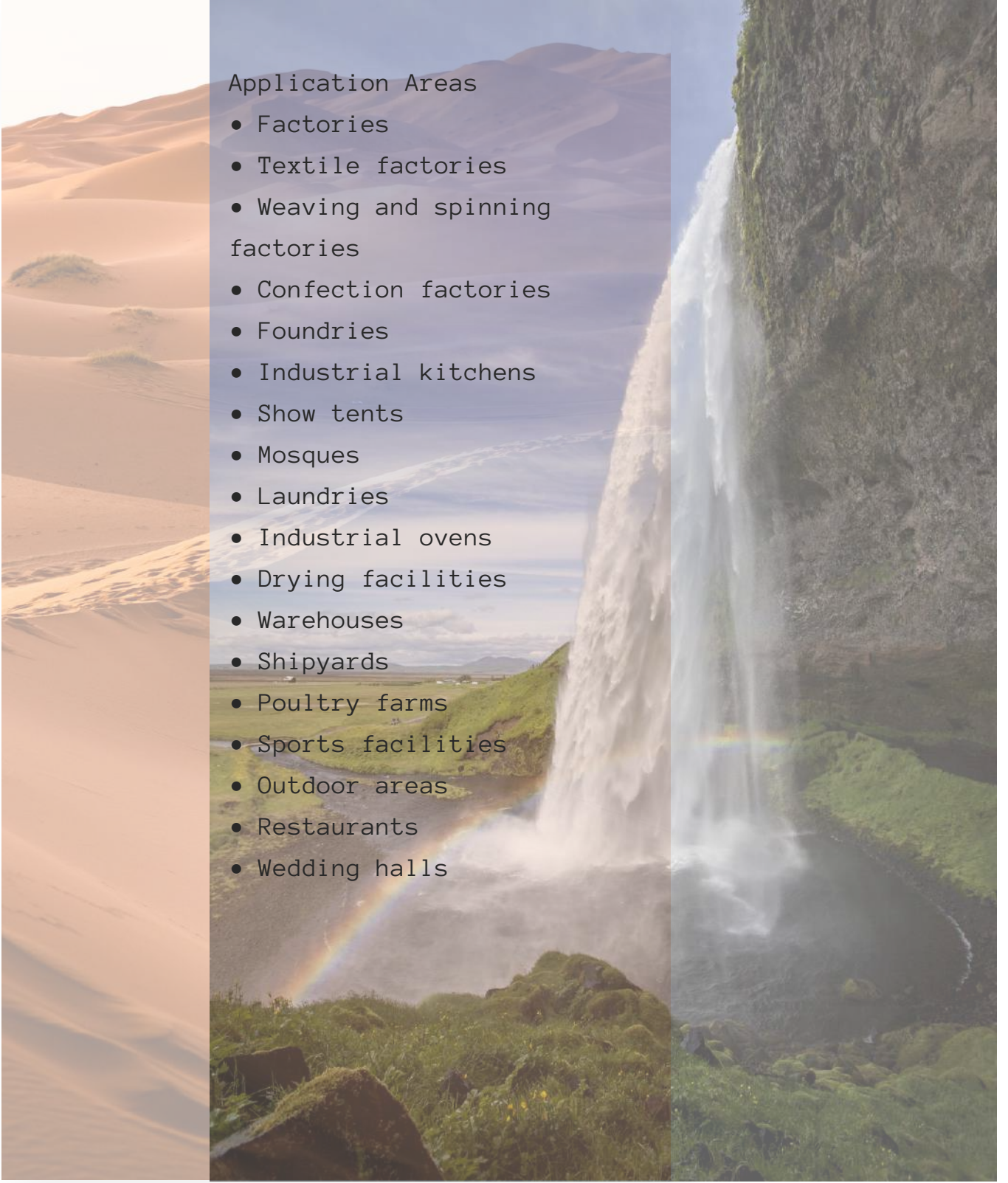
Sideways outlet / Top outlet / Bottom outlet



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Application Areas

- Factories
- Textile factories
- Weaving and spinning factories
- Confection factories
- Foundries
- Industrial kitchens
- Show tents
- Mosques
- Laundries
- Industrial ovens
- Drying facilities
- Warehouses
- Shipyards
- Poultry farms
- Sports facilities
- Outdoor areas
- Restaurants
- Wedding halls

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