

DECACCLIMA

Innovation in Air Handling Units

AIR TREATMENT UNITS FOR EXPLOSIVE ATMOSPHERES

LOM 26.074C-C



ATEX certification in
accordance with
Directive 2014/34/EU

Designed to minimise
the risk of ignition
and leaks

Designed for
ATEX Zones 1 and 2
(Category II 2G)

DECACLIMA

In applications where there is a risk of explosive atmospheres, DECACLIMA provides solutions designed to operate safely, complying with the principles of ATEX regulations and adapting to the actual classification of each project.



Request a **quote**
with no obligation



Our technical team will advise you to find the solution best suited to your needs.

DECACLIMA is specialised in air-conditioning equipment and solutions, offering optimised air treatment units with smart controls for projects that need custom solutions with high technical requirements. It stands out for its customer orientation, providing value, innovation and efficiency in every design and unit it develops.

The quality procedures used by DECACLIMA are certified by BUREAU VERITAS, according to ISO 9001.

CERTIFIED
ISO 9001





The importance of air treatment in ATEX zones

Potentially explosive atmospheres are created by the presence of flammable gases which, at certain concentrations and in combination with oxygen in the air, can cause an explosion.



Mining industry



Waste management



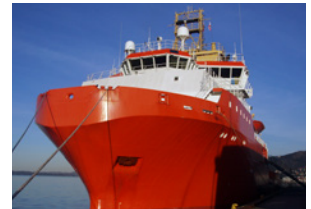
Chemical industry



Laboratories



Grain silos



Marine industry

In ATEX zones, ventilation is essential for:



Reducing the gas concentration



Preventing dangerous build-ups of flammable gases



Protecting people



Protecting production facilities and processes

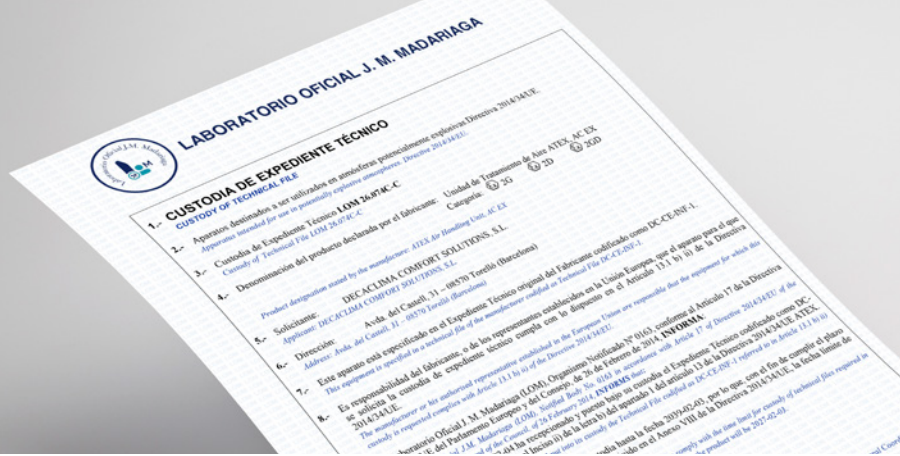


DECACLIMA air handling units allow integrating ventilation, filtration and air flow control in a single system, thereby **contributing to safe and controlled air management in indoor spaces.**



Certifications

Directive 2014/34/EU ATEX



Air handling units intended for use with air coming from areas at risk of explosion must comply with the principles set out in **Directive 2014/34/EU (ATEX). LOM 26.074C-C**

DECACLIMA solutions have been designed to:



Minimise the risks of ignition and leaks



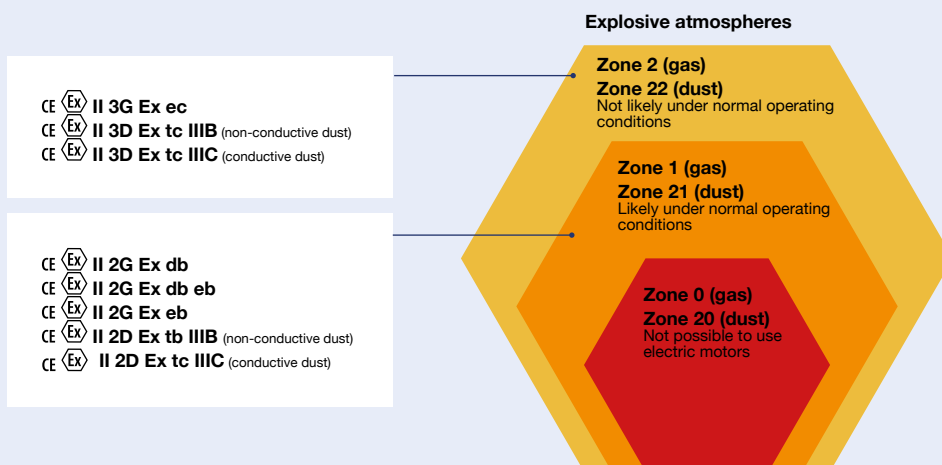
Operate safely in atmospheres containing flammable gas



Work in ATEX Zones 1 and 2 (Category II 2G)

The units are designed so as not to constitute a source of ignition, both under normal operating conditions and in foreseeable situations, taking into account:

- The selection of suitable materials
- A safe mechanical design
- The protection of electrical components
- The control and limitation of surface temperatures



DECACLIMA solutions have been designed according to the highest quality standards, consequently offering **safe, certified air handling units that are tailored to the regulatory and operational requirements of each project.**

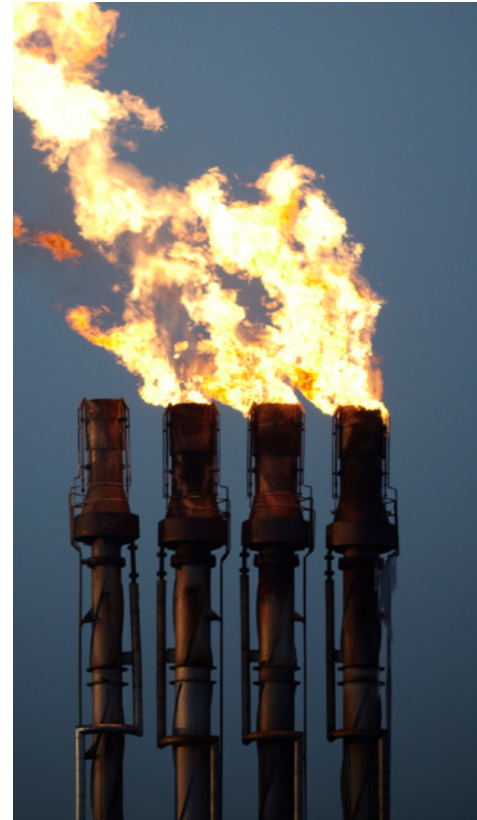
An ATEX zone is an area containing a mixture of air with flammable gas, flammable liquid vapour, combustible liquid mist or combustible dust and when they ignite, they all do so at once.

Sensitivity to gas ignition

| | |
|----------------------|--|
| LFL | Lower flammability limit » % volume. |
| UFL | Upper flammability limit » % volume. |
| MIE | Minimum ignition energy at » 10 ⁻⁶ μ Joules |
| Flash Point | Minimum temperature of a liquid forming inflammable gases |
| Ignition temperature | Temperature at which a gas ignites (T1, T2, T3, T4, T5 and T6) |

Sensitivity to ignition of solids:

| | |
|------------|---|
| LEL or MEC | Minimum explosive concentration » g/m ³ |
| LOC | Limiting oxygen concentration » % volume |
| MIE | Minimum ignition energy at » 10 ⁻³ μ Joules |
| MIT | Minimum ignition temperature in °C: <ul style="list-style-type: none"> – In a MIT cloud n (cloud of dust in contact with a hot surface). – In a MIT layer c with ignition of a layer of 5 mm. – (limit of T the lesser of: 2/3 of MIT n or MIT c -75 °C) |



Definition of zones:

Gases and vapours / Dust:

- **Zone 0 / Zone 20:**

Constantly present during long periods of time or frequently. Not possible to use electric motors.

- **Zone 1 / Zone 21:**

Likely under normal operating conditions

- **Zone 2 / Zone 22:**

Not likely that an ATEX zone will be created under normal operating conditions

Appliance groups and categories:

GROUP I: equipment for underground and surface mining work with hazards posed by firedamp or explosive dust.

- Category M1: must remain operatives
- Category M2: must be able to shut off the power supply

GROUP II: Other risk zones

- Category 1: very high level of protection. Very likely zone.
- Category 2: high level of protection. Likely zone.
- Category 3: normal level of protection. Not a very likely zone.

Selection of category depending on zone

| ZONE | CATEGORY |
|---------|-----------|
| 0 or 20 | 1 |
| 1 or 21 | 1 or 2 |
| 2 or 22 | 1, 2 or 3 |

Selection of zone depending on category

| CATEGORY | ZONE |
|----------|----------------|
| 1 | All |
| 2 | 1, 21, 2 or 22 |
| 3 | 2 or 22 |

Explosion group and temperature class

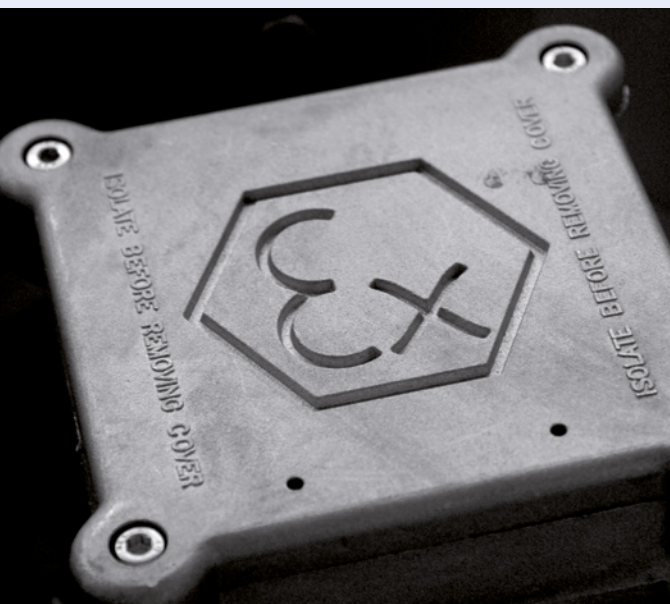
| Explosion group | Temperature class | | | | | |
|-----------------|---|---|---|--|--------------|------------------|
| | T1 | T2 | T3 | T4 | T5 | T6 |
| II A | Acetone Ethane Ethyl acetate Ethyl chloride Ammonia Benzene Acetic acid | Carbon monoxide Methane Methanol Methyl chloride Propane Toluene | 1-amyly acetate Butane N-butyl alcohol Cyclohexane 1,2-dichloroethane Acetic anhydride | Gasoline Otto fuels Aviation fuel Fuel oils Hexane | Acetaldehyde | |
| II B | | Ethyl alcohol Ethylene Ethylene oxide | Hydrogen sulphide | Ethyl ether | | |
| II C | Hydrogen | Acetylene | | | | Carbon disulfide |

Temperature class and ignition temperature

| Temperature class | Ignition temperature |
|-------------------|----------------------|
| T1 | >450 °C |
| T2 | >300 °C |
| T3 | >200 °C |
| T4 | >135 °C |
| T5 | >100 °C |
| T6 | >85 °C |

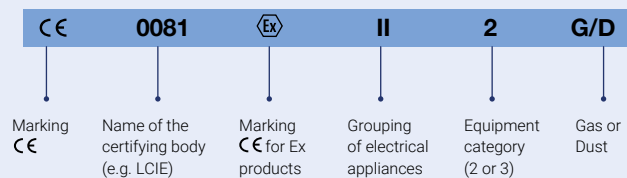
Explosive values of solid combustible materials

| Product | Kmax | Pmax | MIE | LOC | TMIn | TIMc |
|---------------|------|------|-------|-----|------|------|
| Corn flour | 127 | 6.7 | 300 | -- | 530 | 460 |
| Rice flour | 40 | 6.7 | >10 | -- | 370 | 480 |
| Wheat flour | 47 | 8.2 | >300 | 11% | 460 | 470 |
| Malted flour | 100 | 7.8 | >10 | 11% | 310 | 460 |
| Corn starch | 143 | 10.6 | >100 | 9% | 440 | 400 |
| Rice starch | 220 | 10.0 | >10 | -- | 470 | 390 |
| Potato starch | 89 | 9.4 | >3000 | -- | 520 | 570 |



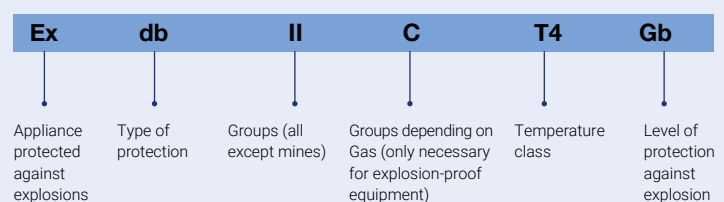
ATEX marked

Motors marked in accordance with ATEX directive



EN marked

Additional standard marking for motors



Combustible gas explosive values

| | Gas group | %vol LFL | g/mol M | | Gas group | %vol LFL | g/mol M |
|--------------------------------|-----------|----------|---------|---------------------------------------|-----------|----------|---------|
| Methane | I | 5.0 | 16.04 | Methyl formate | IIA | 5 | 60.05 |
| Amyl acetate | IIA | 1.1 | 130.19 | Gasoline | | 0.7 | 73.95 |
| Butyl acetate | IIA | 1.2 | 116.16 | Heptane | IIA | 1.1 | 100.20 |
| Ethyl acetate | IIA | 2.1 | 88.11 | Hexane | IIA | 1.2 | 86.18 |
| Methyl acetate | IIA | 3.1 | 74.08 | Hexane | IIIA | 1.2 | 102.18 |
| Propyl acetate | IIA | 1.7 | 102.13 | Kerosene | IIA | 0.7 | 87.00 |
| Acetone | IIA | 2.2 | 55.06 | Methylamine | IIA | 4.9 | 31.06 |
| Acetonitrile | IIA | 3.0 | 41.05 | Methylcyclohexane | IIA | 1.1 | 98.19 |
| Acetic acid | IIA | 4.0 | 60.05 | Carbon monoxide | IIA | 12.5 | 28.01 |
| Acetic aldehyde | IIA | 4.0 | 44.05 | Naphthalene | IIA | 0.9 | 128.17 |
| Ammonia | IIA | 15.0 | 17.03 | Nitroethane | IIA | 4.0 | 75.07 |
| Aniline | IIA | 1.2 | 107.13 | Nitromethane | IIA | 7.1 | 61.04 |
| Benzene | IIA | 1.2 | 78.11 | Nonane | IIA | 0.7 | 128.26 |
| Bromobutane | IIA | 2.6 | 137.02 | Nonane | IIA | 8.0 | 144.26 |
| Bromoethane | IIA | 6.7 | 108.97 | Octane | IIA | 6.0 | 114.23 |
| Butane | IIA | 1.5 | 58.12 | Pentane | IIA | 1.4 | 72.15 |
| Butane | IIA | 1.4 | 74.12 | Pentane | IIA | 1.2 | 88.15 |
| Butyl methyl ketone | IIA | 1.2 | 100.16 | Petroleum | IIA | 1.0 | 87.00 |
| Butylamine | IIA | 1.7 | 73.14 | Pyridine | IIA | 1.7 | 79.10 |
| Cyclobutane | IIA | 1.8 | 56.11 | Propane | IIA | 2.0 | 44.10 |
| Cyclohexane | IIA | 1.2 | 84.16 | Propane | IIA | 2.1 | 60.10 |
| Cyclohexane | IIA | 1.2 | 100.16 | Propene (propylene) | IIA | 2.0 | 42.08 |
| Cyclohexanone | IIA | 1.3 | 98.14 | Propylamine | IIA | 2.0 | 59.11 |
| Cyclopentane | IIA | 1.1 | 70.13 | Toluene | IIA | 1.2 | 92.14 |
| Chlorobenzene | IIA | 1.1 | 112.56 | Triethylamine | IIA | 1.2 | 53.15 |
| Chlorobutane | IIA | 1.8 | 92.57 | Trimethylamine | IIA | 2.0 | 59.11 |
| Chloroethane | IIA | 3.6 | 64.51 | Xylene | IIA | 1.0 | 106.17 |
| Chloroethane | IIA | 5.0 | 106.97 | 1,2-epoxypropane (propylene oxide) | IIB | 1.9 | 58.08 |
| Chloroethylene(vinyl chloride) | IIA | 3.8 | 62.50 | 1,3,5-trioxane | IIB | 3.6 | 90.08 |
| Chloromethane | IIA | 7.6 | 50.49 | 1,3-butadiene | IIB | 1.4 | 54.09 |
| Chloropropane | IIA | 2.6 | 78.54 | 1,4-dioxane | IIB | 1.9 | 88.11 |
| Acetyl chloride | IIA | 5.0 | 78.50 | Cyanhydric acid | IIB | 46.5 | 27.03 |
| Allyl chloride | IIA | 3.3 | 76.53 | Ethyl acrylate | IIB | 1.7 | 100.12 |
| Cresol | IIA | 1.0 | 108.14 | Methyl acrylate | IIB | 2.4 | 86.09 |
| Decahydronaphthalene(decaline) | IIA | 0.7 | 138.25 | Acrylonitrile | IIB | 2.8 | 53.06 |
| Decane | IIA | 0.81 | 42.28 | Tetrahydrofurfuric alcohol | IIB | 1.5 | 102.13 |
| Diacetone alcohol | IIA | 1.8 | 116.16 | Cyclopropane | IIB | 2.4 | 42.08 |
| Dichloroethane | IIA | 5.6 | 98.96 | Dibutyl ether | IIB | 0.9 | 130.23 |
| Dichloroethylene | IIA | 6.5 | 96.94 | Diethyl ether | IIB | 1.9 | 74.12 |
| Dichloropropane | IIA | 3.4 | 112.99 | Ethyl methyl ether | IIB | 2.0 | 60.10 |
| Diethylamine | IIA | 1.7 | 73.14 | Ethylene | IIB | 2.7 | 28.05 |
| Dimethylamine | IIA | 2.8 | 45.08 | Furan | IIB | 2.3 | 68.08 |
| Dimethylamine | IIA | 1.2 | 121.18 | Coke oven gas | IIB | 5.0 | |
| Dipropyl ether | IIA | | 102.18 | Methylacetylene (propyne) | IIB | 1.7 | 40.06 |
| Styrene | IIA | 1.1 | 104.15 | Isopropyl nitrate | IIB | 2.0 | 105.09 |
| Ethane | IIA | 3.0 | 30.07 | Ethylene oxide (epoxyethane) | IIB | 2.6 | 44.05 |
| Ethane | IIA | 3.3 | 46.07 | Tetrahydrofuran | IIB | 1.5 | 72.11 |
| Ethyl methyl ketone | IIA | 1.8 | 72.11 | Acetylene | IIC | 1.5 | 26.04 |
| Ethylbenzene | IIA | 1.0 | 106.17 | Carbon disulphide | IIC | 1.0 | 76.13 |
| Ethyl mercaptan | IIA | 2.8 | 62.13 | Hydrogen | IIC | 4.0 | 2.02 |
| Feno | IIA | 1.3 | 94.11 | | | | |
| Ethyl formate | IIA | 2.7 | 74.08 | | | | |

Advantages and safety features



In areas at risk of explosion where a high level of safety, reliability and energy efficiency is required, DECACLIMA's ATEX-certified air handling units offer a solution designed to ensure stable, continuous and safe operation while meeting the highest quality standards.



Safe and stable operation

They ensure reliable and controlled operation, even in demanding applications and environments with high safety requirements.



Straightforward installation and maintenance

A modular and configurable design that facilitates installation and maintenance, as well as adaptation and future extensions or modifications to the system.



Energy efficiency

High-efficiency solutions featuring high-performance **EC Technology** motors that optimise energy consumption and adjust output to the actual demand, ensuring maximum performance with lower energy consumption.



Main safety characteristics

Decaclima's air handling units are ATEX-certified in accordance with Directive 2014/34/EU, therefore meeting the highest safety standards for applications involving the risk of explosive atmospheres.

- **Fans and motors selected for applications where there is a risk of explosion**

- **Protected electrical and control components**

- **A design that prevents the generation of mechanical or electrical sparks**

- **Limitation of surface temperatures**

- **Designed for ATEX Zones 1 and 2 (Category II 2G)**



Construction aspects



ATEX

DECACLIMA air handling units stand out for their **robust construction and high degree of adaptability** to the specific requirements of each installation.



Filters

Bag filter for use in ATEX-certified explosive atmospheres, thereby combining high efficiency in fine dust retention with maximum safety. Suitable for zones 1, 2, 21 and 22 in accordance with Directive 1999/92/EC, available in bag and Mini Pleat versions, with filtration classes ranging from M5 to H13.



Inspection window in accordance with ATEX regulations

Inspection window designed in accordance with ATEX regulations, which allows visual inspection of the interior of the unit without compromising safety.



ATEX sensors and safety components

Accessories and safety components compliant with ATEX regulations, which incorporate lighting, circuit breakers, local isolator switches and sensors for differential pressure, temperature and operational status, thereby ensuring precise control, fault detection and protection in environments where there is a risk of explosive atmospheres.



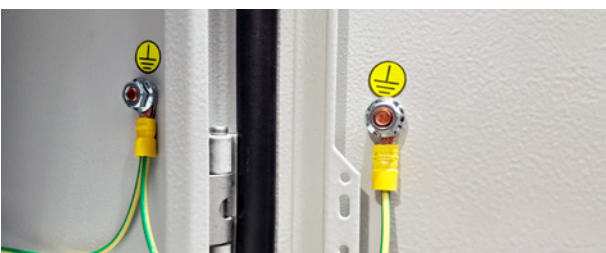
ATEX fans and motors

High performance centrifugal fans fitted with motors ATEX-certified with Ex d flameproof protection, suitable for Zone 1 (gas) and classified for gas group IIC, ensuring a high level of safety in potentially explosive atmospheres.



Multi-leaf dampers and actuators compliant with the ATEX Directive

Robustly designed dampers suitable for applications where there is a risk of explosive atmospheres, equipped with specific actuators that ensure reliable control of the airflow.



Earth cable

Earthed metal structure, panels and components, thereby preventing the build-up of static electricity.



Control and regulation system

Control system for monitoring and regulating airflow, pressures, temperatures and equipment status, designed for integration into BMS systems.

DECACLIMA

INNOVATION IN AIR HANDLING UNITS

FULL AND SMART CONTROL OF YOUR HVAC SYSTEMS

DECONTROL



Centralised management
and complete control



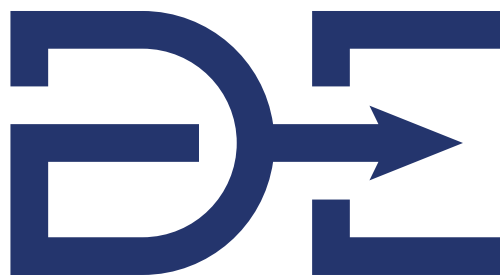
Real-time data and
predictive maintenance



Energy efficiency
and sustainability



Safety and
compatibility



Innovation in Air
Handling Units

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