

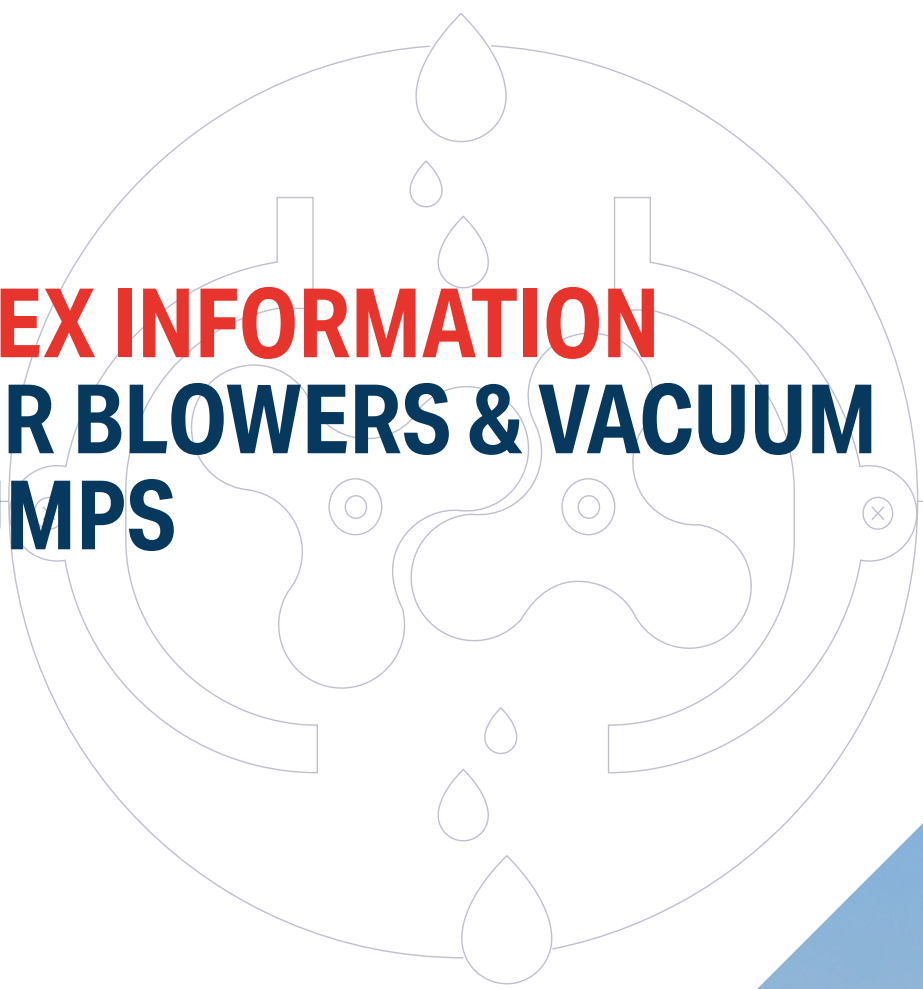


An Ingersoll Rand Business

PRESSURE & VACUUM  
SOLUTIONS

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# ATEX INFORMATION FOR BLOWERS & VACUUM PUMPS



ATEX generally refers to the **hazard of explosive atmospheres occurring in the workplace.**

ATEX is the name commonly given to European directives relating to the control of explosive atmospheres on minimum requirements for improving the health and safety protection of workers potentially at risk from explosive atmospheres.

Explosion protection of machines such as positive displacement blower is of great importance for both the users and the manufacturers of these machines. In Europe, the **ATEX directives** stipulate the requirements for equipment used in explosion-prone areas.

The fields of activity usually concerned by ATEX are: Oil and natural gas industry, Petroleum, natural gas transportation and storage, Petrochemical industry, Chemical industry, Cosmetics industry, Pharmaceutical industry, Food, beverage and tobacco, Shipyards and offshore industries, Wood processing industry, Recycling plants and waste disposal companies, Landfills, Water purification, Automotive industry, O.E.M. (Original Equipment Manufacturer.)

## WHAT IS A POTENTIALLY EXPLOSIVE ATMOSPHERE?

By definition, an explosive atmosphere (ATEX) results from a mixture with air of combustible substances (flour, wood dust, solvent vapors, gases), in such proportions that an ignition source of sufficient energy produces its explosion or ignition.

The explosion, unlike fire, is an almost instantaneous combustion. It causes a significant blast effect, accompanied by flames and heat. It can only occur after the formation of an explosive atmosphere (ATEX).

There are different conditions that can determine an explosive atmosphere, with different degrees of danger: depending on the type of fuel and the temperature class. In certain work environments, the presence of combustible gases, vapors, aerosols or dusts can cause the formation of explosive atmospheres.

A hazard exists when the fuel, oxidizer, and ignition source are present; any material should be considered and evaluated as a source of ignition.

For an explosion to occur, a certain number of conditions must be met simultaneously:

- Presence of an **oxidizer** (usually oxygen, air) and presence of a fuel mixed in proportions and at a given pressure where the explosion can take place.
- Presence of a **source of ignition**, static electricity, electric arc, hot spots, sparks due to friction, heating due to the compression of the mixture, chemical reaction, etc.



## REQUIREMENTS

You should know that there are **several categories of equipment** depending on the ATEX zone in which your company is located, in order to best meet your requirements.

There are different categories :

- ③ **Normal and low presence**
- ② In case of **defect and probable presence**
- ① In case of **rare defect and permanent presence**.

One of the most important steps in the process of avoiding the risk of explosion is the **delimitation of explosion risk zones** (known as «**ATEX zones**»). This zoning focuses on characterising the possibility of the formation of an explosive atmosphere and quantifying its volume.

## CHARACTERISATION OF THE ZONE (DANGEROUSNESS AND EXTENT)

The aim of ATEX zoning is to define the risk and match the equipment to be used (electrical and non-electrical) by zone.

There are **3 levels of atex zone classification** depending on the degree of release of the combustible material source and the nature of the ventilation in place. A distinction is made between areas with **gas or vapours** and **areas with dust**.

## GAS / VAPOUR

**ZONE 0** Explosive atmosphere present **permanently** or for long periods during normal operation = permanent, long term or frequent hazard

**ZONE 1** Explosive atmosphere present **occasionally**, in normal operation = occasional danger

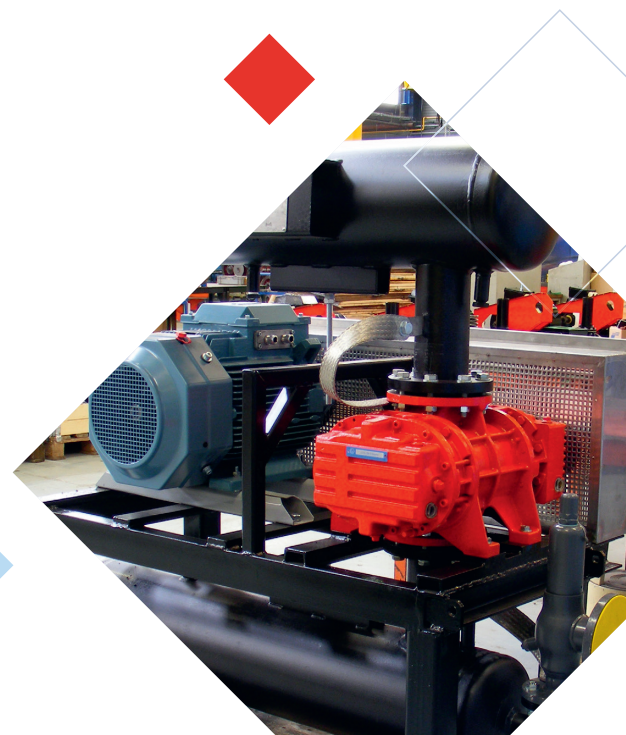
**ZONE 2** Explosive atmosphere present **accidentally**, in case of malfunction or for short periods of time = rare or short term hazard

## DUST

**ZONE 20** Explosive atmosphere present **permanently** or for long periods during normal operation = permanent, long-term or frequent hazard

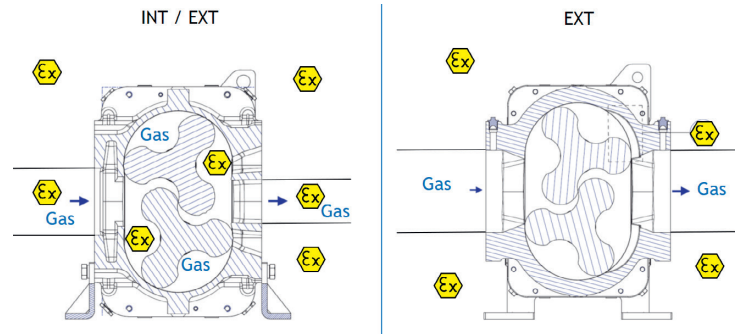
**ZONE 21** Explosive atmosphere present **occasionally**, in normal operation = occasional danger

**ZONE 22** Explosive atmosphere present **accidentally**, in case of malfunction or for short periods of time = rare or short term hazard



## HOW TO SEE IF AN EQUIPMENT IS UNDER ATEX DIRECTIVE?

The above specific explosion protection marking can be found on all electrical and mechanical equipment that has been tested and approved for use in ATEX zones. You will easily recognize the hexagonal shape of the logo, with a yellow background and black border.



	II	2	G/D	Ex	c	IIB / IIIB	160 °C	Gb/Db	INT / EXT
Explosive atmosphere symbol	Equipment group, I (Mining) or II (Non mining)	Equipment category 2 or 3	G (Gas) or D (Dust)	Ex symbol	Safety construction protection strategy "c" protection by construction	Gas class/ Dust class	Max. surface temp.	Level of protection b or c	External or / and internal protection

## TEMPERATURE CLASSIFICATION

The auto-ignition temperature, given for a combustible product (gas, vapour, dust) is the temperature at which the mixture with air ignites spontaneously. There is no need to bring a specific ignition source (flame, spark, electric arc, etc.) to the mixture; the temperature is sufficient to ignite the mixture.

Manufacturers commit to a temperature of their equipment via temperature classes. If the equipment has a temperature **class of T2**, then the manufacturer guarantees, under the given conditions, that the surface temperature of his equipment will never exceed **300 °C**.

The maximum permissible surface temperature must always be below the self-ignition point.

## HIBON ATEX CERTIFICATION AND COMPLIANCE POSSIBILITY

**Standard / ATEX-compliant blowers Category 2 or 3 ATEX-compliant blowers:** these comply with the ATEX European directive and are suitable for the pumping/compression of gas, gaseous mixtures and unflammable or flammable dust.

All the category 2 ATEX-compliant blowers have been specially developed to pump/compress a flammable atmosphere, classified as an internal zone 1 or 2, without needing to install protective devices such as flame guards. The blowers have also been designed to function in an exterior flammable environment classified as zone 1/21 or 2/22. The blowers are certified (according to **directive 2014/34/UE**) as category 2 or 3 equipment according to the European ATEX directive.

The blowers have been designed following the rules of safety construction, which ensure the elimination of potential sources of ignition, even if there are disturbances and frequent malfunctions. The blowers are suitable for pumping/compressing a wide range of flammable gasses and vapors,

The category 2 or 3 ATEX-compliant blowers must be built into a larger system whose internal atmosphere is classified as **zone 1/21** or **2/22**. These systems will be certified according to the above mentioned directive and must have an ATEX identification label affixed to them. For the certification to be valid, the blowers must be installed exactly as specified by Hibon.

The temperature classification that applies to the category 2 or 3 ATEX-compliant blowers refers to the spontaneous combustion temperature of flammable materials that can be pumped/compressed, or that may be present in the external atmosphere. The temperature classification of the ATEX-compliant blowers is **200 °C (T3) (392 °F)** for gaseous/dusty internal and external atmospheres.

For dusty external atmospheres, you should provide an appropriate security margin for using the blower according to the type/composition of the dust and the thickness of the dust layers

The category 2 or 3 ATEX-compliant blowers are based on the safety construction principle for the safe pumping/compressing of flammable materials. Under normal operating conditions, as defined by Hibon, they can safely pump/compress flammable materials as long as particles (of more than **100 µm for Truck Blowers ; 25 µm for Process Blowers**) cannot penetrate, which could cause damage to the blower.

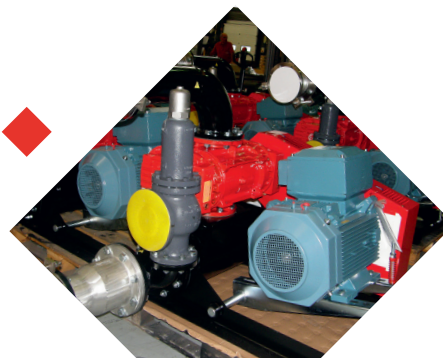
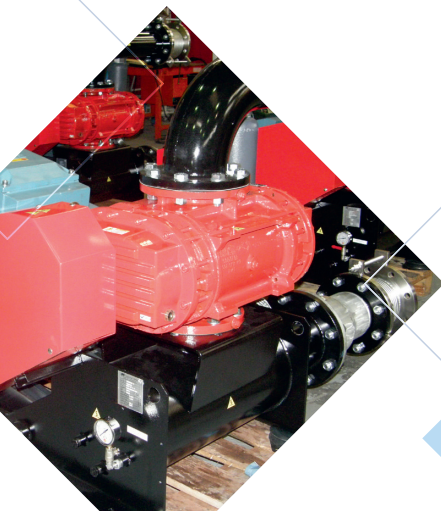
Before using blower, you must ensure that these materials are compatible with the gasses and vapors that could be present in the external atmosphere. During operation with inflammable gas, the blower has to be inert before operation to prevent any risk.

If you would like to know more about this topic, please contact us.

Visit our dedicated page on HIBON Website !

## A CENTURY OF EXPERIENCE

For more than 100 years, Hibon has been supplying air blowers, process gas blowers, neutral gas blowers, vacuum pumps and blower units with operating pressures of up to 1 bar and vacuum levels of up to 92 %. Our products and services are based on our decades of experience, technological expertise and close contact with the customer. To meet and even exceed customer expectations, our engineering team continuously refines our blower and pump solutions, ensuring that they provide an ever higher efficiency and reliability.



### INGERSOLL RAND AIR SOLUTIONS HIBON<sup>®</sup>

2 avenue Jean-Paul Sartre,  
59290 WASQUEHAL  
France

T : +33 (0)3 20 45 39 39

E : [hibon@irco.com](mailto:hibon@irco.com)

[www.ingersollrand.com](http://www.ingersollrand.com)  
[www.hibon.com](http://www.hibon.com)