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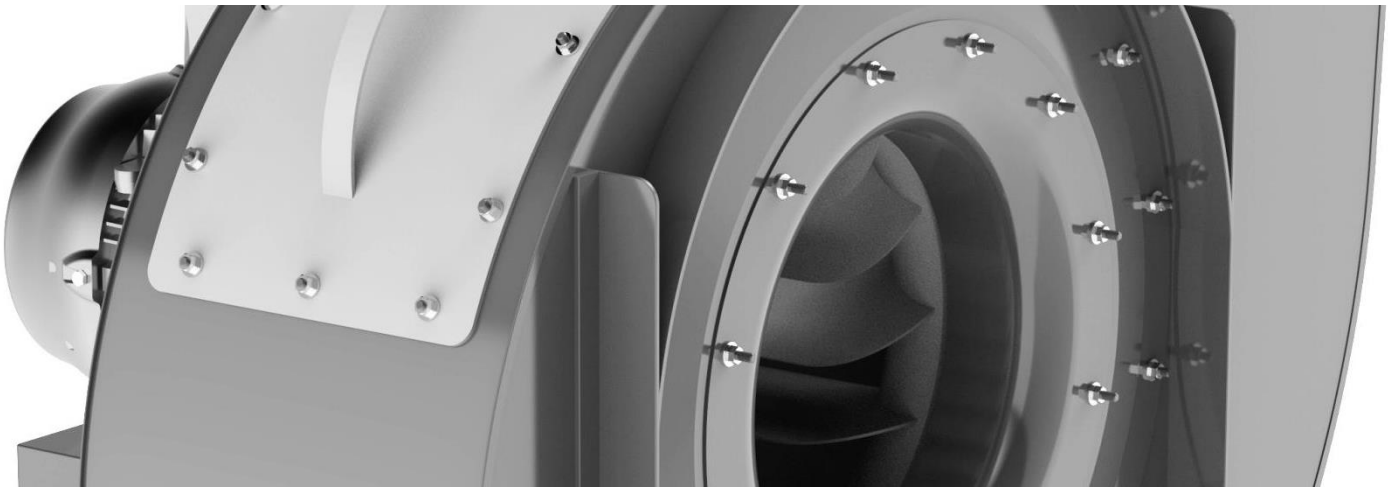
Atex appendix for centrifugal fans

Supplement to general manual



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INDEX

All the information in this appendix must be carefully read and understood. Pay particular attention to the operating standards with ATTENTION signals as their non observance can cause damage to the persons and/or machine.

Particular requirements for the installation and use in hazardous areas with gas or combustible dust.
Homogeneous Series - All Sizes for potentially explosive environments
Zone 1-21-1/21 and 2-22-2/22
Category 2G -2D-2GD and 3G -3D-3GD

Remark:
Save this Atex appendix together with the general manual for possible future references. We reserve the right to improve or modify manual or products and fittings with any obligation to update previous productions and manuals.

This Atex appendix should be used together with the general manual.

1.0 INTRODUCTION

This supplement has been prepared to meet the explosion safety requirements established by laws, guidelines and reference standards for centrifugal fans by the manufacturer mentioned on the fan label and certificate. This is an integration of the general manual and Atex appendix for the finished equipment (or partly completed) and this process should always be followed until the fan is dismantelled. For the finished machinery (or partly completed) the ownership change must always be given to the new owner since it constitutes fan kit. In order to ensure its consultation in the best condition possible, this Atex appendix and general manual, must be made available to the person authorized to intervene in order to serve its purpose.

In case of loss, damage or illegibility (partial or total), the documentation replacement must be requested directly to Ventinet B.V. mentioning the name of this manual.

In relation to laws, guidelines and reference standards mentioned above, **only trained personnel on explosion risks may be authorized to operate in ATEX classified areas**. In support of the above, the following is an extract of the Legislative Decree no. 81/2008 of 09/04/2008 - Title XI - ANNEX L:

1. Organisational measures.
1.1. Workers Training.
The employer provides a suitable and appropriate training with regards to the explosion protection of personnel employed in activities where explosive atmospheres may occur.
1.2. Written instructions and permits to work.
Where required by the explosion protection document:

a) work in hazardous places must be carried out in accordance with written instructions issued by the employer;
b) a license system must be applied for dangerous activities and actions that can become dangerous when they interfere with other work.

License to work must be issued before the commencement of work by a qualified person.

2.0 REFERENCE STANDARDS AND LAWS

ATEX fans are built in accordance with the following standards:
- Machine Directive 2006/42/CE;
- ATEX Directive 2014/34/UE;
- Low Voltage Directive 2006/95/CE;
- Electromagnetic Compatibility Directive 2004/108/CE;
- UNI EN ISO 3744:2010 Acoustics -- Determination of sound power levels and sound energy levels of noise sources using sound pressure - Engineering methods for an essentially free field over a reflecting plane.
- UNI EN ISO 5801:2009 Industrial Fans - Performance Testing Using Standardized Airways
- UNI EN 13184:2004 This standard describes the techniques for the determination of the rate of leakage across the boundary of an isolated object, subjected to a pressure difference. The techniques are based on the evaluation of the change of the mass of gas within the test object.
- UNI EN ISO 13349:2011 Fans – Vocabulary and definitions of the categories.
- UNI EN 13463-1:2009 Non-electrical equipment for use in potentially explosive atmospheres; Part 1: Basic method and requirements.
- UNI EN 13463-3:2011 Non-electrical equipment for use in potentially explosive atmospheres; Part 3: Protection by flameproof enclosure “d”;
- UNI EN 13463-5:2011 Non-electrical equipment for use in potentially explosive atmospheres; Part 5: Protection by constructional safety ”'c”;
- UNI EN 14986:2007 Design of fans working in potentially explosive atmospheres;
- CEI EN 50014 Electrical equipment for potential explosive atmospheres General Rules;
- CEI EN 50281-3 Definition of areas with danger of explosion due to the presence of inflammable dusts. Part 3: Definition of areas where are present or can be present combustible dusts;
- CEI EN 60079-0 Electrical apparatus for explosive atmospheres due to the presence of gas - Part 0: General rules;
- CEI EN 60079-1 Electrical apparatus for explosive atmospheres due to the presence of gas - Part 1: Electrical Equipment protected with explosion proof coverings "d";
- CEI EN 60079-2 Electrical apparatus for explosive atmospheres due to the presence of gas - Part 2: Equipment with over pressure protection mode"p";
- CEI EN 60079-5 Electrical apparatus for explosive atmospheres due to the presence of gas - Part 5: Equipment with filling protection mode"q";
- CEI EN 60079-6 Electrical apparatus for explosive atmospheres due to the presence of gas - Part 6: Equipment with oil immersion protection mode;
- CEI EN 60079-7 Electrical apparatus for explosive atmospheres due to the presence of gas - Part 7: Equipment with increased security protection mode;
- CEI EN 60079-10 Electrical apparatus for explosive atmospheres due to the presence of gas 10: Classification of dangerous areas;
- CEI EN 60079-11 Electrical apparatus for explosive atmospheres due to the presence of gas - Part 11: Equipment with intrinsic security protection mode "i";
- CEI EN 60079-15 Electrical apparatus for explosive atmospheres due to the presence of gas - Part 15: Building, test and marking of electrical apparatus with protection mode "n"
- CEI EN 60079-18 Electrical apparatus for explosive atmospheres due to the presence of gas - Part 18: Equipment with encapsulation protection mode "m";
- CEI EN 60079-31 Flammable Atmospheres - Part 31: Ignition dust protection devices through protective coverings "t";
- CEI EN 61241-1 Electrical equipment to be used with ignition dust – Protection through coverings “tD";
- CEI EN 61241-4 Electrical equipment to be used with ignition dust – Protection type "pD";
- CEI EN 61241-11 Electrical equipment to be used with ignition dust – Intrinsic Protection type "iD";
- CEI EN 61241-18 Electrical equipment to be used with ignition dust – Protection through encapsulation "mD".

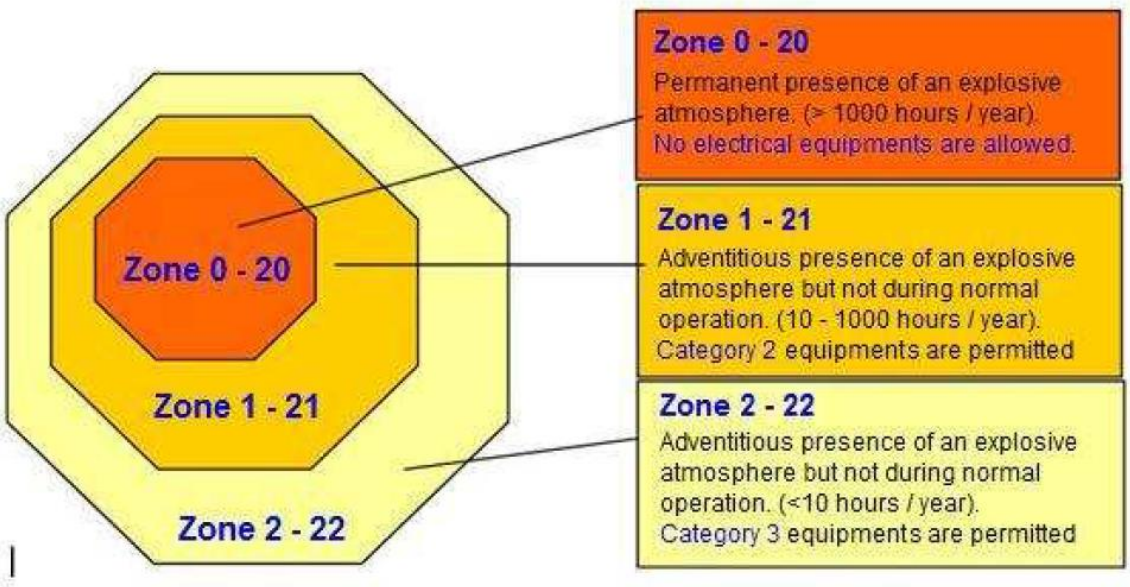
3.0 AREAS AND HAZARDOUS ZONES

Hazardous areas are places where, under certain conditions, explosive atmospheres may occur.

An explosive atmosphere is characterized by the simultaneous presence of oxygen (oxidizing), flammable substances in form of gas, vapor, mist and / or dust (fuel) in which, after ignition (heat), the combustion spreads to together with the unburned mixture.

The user, or his representative, is required to make UNDER HIS OWN RESPONSIBILITY the assessment of the zones type. He will also have to draw up a comprehensive risks assessment (possibly making use of qualified personnel) in which they are duly taken into consideration all the equipment and the possible risks***. Only after this operation is completed, the requests to suppliers can be carried out.***

CEI EN 60079-10 and EN 50281-3 provide criteria for the classification of hazardous areas in relation to chemical, physical characteristics and quantity of the substances used, as well as a function of frequency and of the time period in which such mixture is manifested. In figure 1 is depicted the summary definition schema.



Picture 1 - ATEX zones definition schema in according to EN 60079-10 and IEC 50281-3 with the allowed product categories for each zone.

4.0 TEMPERATURE CLASSES (for atmosphere with GAS)

All devices in danger areas should be classified according to the maximum surface temperature that may develop both in normal operation and in case of failure.

The European standard EN 50014 provides, for maximum surface temperature, six classes from T1 to T6 (see table below) with a reference ambient temperature of +40 [°C]. In case of different reference temperature, the variation must be specified on the appliance.

MAXIMUM SURFACE TEMPERATURE [℃]	CLASS
> 450	T1
300 ÷ 450	T2
200 ÷ 300	T3
135 ÷ 200	T4
100 ÷135	T5
85 ÷ 100	T6

Table 1 - Temperature class description

The explosion-proof fans are manufactured according to the temperature classes in the following table.

Directly Coupled Fans in execution 4 – 5		
THERMAL CLASS	ENVIRONMENTAL TEMPERATURE	WORKING TEMPERATURE
T 135 [℃] (T4)	-20 [℃] ÷ +40 [℃]	-20 [℃] ÷ +40 [℃]
T 200 [℃] (T3)	-20 [℃] ÷ +40 [℃]	-20 [℃] ÷ +105 [℃]
T 300 [℃] (T2)	-20 [℃] ÷ +40 [℃]	-20 [℃] ÷ +150 [℃]

Transmission Coupled Fans in execution 1 – 8 – 9 – 12		
THERMAL CLASS	ENVIRONMENTAL TEMPERATURE	WORKING TEMPERATURE
T 200 [℃] (T3)	-20 [℃] ÷ +40 [℃]	-20 [℃] ÷ +55 [℃]
T 300 [℃] (T2)	-20 [℃] ÷ +40 [℃]	-20 [℃] ÷ +135 [℃]

Table 2 – The fans production subdivided according to the execution and temperature class, with relative indication of the environmental temperature and the working temperature.

5.0 INSTALLATION

Fans installation in environments with a potentially explosive atmosphere, is sole responsibility of the user.

Users in application of relevant standards prior to installation shall:

- Assess the risks of the environment in which he intends install the equipment;
- Identify the type of hazardous atmosphere (Gas or Dust);
- Define the Zone (0 – 1 – 2 oppure 20 – 21 – 22);
- Identify the Product category[1] (1G – 2G – 3G or 1D – 2D – 3D);
- Be sure that the license nameplate of the fan corresponds to the ordering data.

6.0 COMMISIONING

In addition to the normal startup instructions contained into the general manual and maintenance for NON ATEX fans, the guidelines listed below must also be followed:
- Create equipotential links for all fan metal parts[2]
- Connect the safety grounding with braided copper cable equipped with cable lug;
- For the electric motor (EExd - Eexe - EExn - DIP) follow the instructions listed into the specific manual of use and maintenance of the electric motor constructor.

7.0 VIBRATION CHECK

Fans installed in explosion-proof areas 21 and 22, must be subject to periodic vibration. In case of encounter of potentially dangerous vibrations, in accordance to ISO 14694, the fan must be stopped and, before it can be restarted, it must have been removed due to the onset of vibration.

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[1] Category: Set of products designed to operate in accordance with specific operating parameters and to guarantee a certain level of protection for the intended use in specific environments. Using G letter to indicate the use of the device in potentially explosive atmospheres of gas type and D to indicate the use of the device in potentially explosive dusty type, we distinguish:

1G and 1D: Machinery characterized by anti-explosion protection systems so that in case of failure of one protection system, at least an independent second system, provides the requisite required security level; or, if two faults occur independently of each other, is guaranteed the required protection level;

2G ed 2D: The explosion protection on this category must operate in order to ensure the required level of security even in presence of malfunction of the equipment or dangerous operating conditions which frequently must be taken into account.

3G e 3D: This type of product belonging to the category in question must ensure the level of security required in normal operation.

[2] It is compulsory for the person or company that carries out the in-site machinery (or partly completed machinery) incorporation realize all the equipotential links to prevent the generation of sparks in environments where may be present a potentially explosive atmosphere.

8.0 ATEX FAN NAMEPLATE

In accordance with the ATEX directive 2014/34/EU (Ref Chapter III, art. 10), fans designed to operate in potentially explosive atmospheres are identified by nameplate. In the figure below there is a copy of the ATEX fan nameplate.

Picture 2 - ATEX centrifugal fans nameplate

9.0 ATEX MARKING

The string digits of the ATEX nameplate shown in Figure 2 are divided as follows:

	String for GASEOUS environments						
European Community Trademark	Antispark Products logo	Group	Internal/External Category	Explosive Atmosphere Type (G=Gas)	Protective shape	Gas belonging Group	Temperature Class
CE	Ex	II	2/2	G	c	IIB	T3

String for DUSTY environments						
European Community Trademark	Antispark Products Logo	Group	Internal/External Category	Protective shape	Explosive Atmosphere Type (D=Dust)	Temperature Class [°C]
CE	Ex	II	2/2	c	D	T185

Table 3 - ATEX string exemplification

10.0 DECLARATION OF CONFORMITY

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CE **DECLARATION OF CONFORMITY** Ex

The distributor Ventinet B.V.
Cartografenweg 26
5141 MT Waalwijk – The Netherlands

Declares under his own responsibility that the assemble comprised by following components:

Industrial Blower: Atex II2G VN-RS 502 T – 15 kW

Serial number: 07 /20-02645/01-001

ATEX String: II 2G c IIB T4

Electrical Motor: *ATEX String* ATEX Eex-d IIC T4

Complies with ATEX Directive with string: Ex II 2G c IIB T4

Working reference temperature for above reported string is comprised info range: -20; +40 °C

Ventinet B.V. declares that, in compliance with above statements, no risks deriving from above reported components joint can occur. Above resumed elements can be replaced only by parts provided with similar or higher level ATEX certification.

0205919 - 05/06/2017

TÜV NORD TÜV CYPRUS File Stored

Waalwijk, 23/07/2020

General Manager

Antoon Maes

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ventinet

DECLARATION OF CONFORMITY

The distributor Ventinet B.V.
Cartografenweg 26
5141 MT Waalwijk – The Netherlands

Industrial Blower: Atex II2G VN-RS 502 T – 15 kW

Serial number: 07 /20-02645/01-001

Complies with ATEX Directive with string: II 2G c IIB T4

Has been distributed in the market by Ventinet and made by [illegible] Srl (Via Luigi Pirandello, 10, 20825 Barlassina) according to:

DIRECTIVE	STANDARD
2014/34/UE: 26-02-2014	UNI EN 1127-1:2008
2006/42/CE: 17-05-2006	UNI EN 14986:2007
	UNI EN 13463-1:2009
	UNI EN 13463-5:2004

All equipment assembled to machine are provided with ATEX certification. For this reason their declaration of conformity must mandatorily be supplied together with present declaration and blower.

Blower is provided with use and maintenance manual which is relevant part of supply. This document must be kept together with the fan during its entire life cycle.

Technical file concerning industrial centrifugal blower has been registered by TUV Nord Italia certification body who released following dossier number:

0205919 - 05/06/2017

Waalwijk, 23/07/2020

General Manager

Antoon Maes

11.0 PROPAGATION AREA

The fans comply with the directive ATEX 2014/34/EU consequently leakage through flanges, welding, bolting, etc.. are reduced below the maximum permissible threshold but not totally prevented. It is therefore possible the presence of an area at risk of explosion all around the fan. Calculations performed by the use of the CEI EN 60079-10 have highlighted the possible presence of a zone in danger of explosion all around the fan, for a minimum distance dz that is proportional to the characteristic dimension of the fan itself. For this reason, close to the machinery is required to use ATEX equipment conforming or belonging to immediately below category respect to the fan one. Below is depicted the table that allows you to identify the size of the area of propagation around each fan object of the technical dossier.

Developed Pressure	Characteristic dimension [mm]	Minimum distance dz [m]
Low – Medium	180 ÷ 710	1
	800 ÷ 1250	2
	1400 ÷ 1600	3
High	350 ÷ 1250	1
	1400 ÷ 1600	2

Table 4 - Minimum distance dz in the propagation area as a function of the pressure developed by the fan and its characteristic dimension.

Similarly, if the fan is set in a potentially explosive area, can be a reverse propagation (from the outside to the inside of the cochlea), therefore the fan must always be built with an internal conformation compatible with the outside atmosphere.

12.0 USES

Fans distributed by Ventinet B.V. have been specifically designed to carry out their functions in operating conditions which vary according to the model series. The structural features therefore change depending on the conditions of normal use (defined at the time of purchasing of the partly/finished equipment).

Fans above can be used in environments potentially at risk due to the presence of explosive gases or dusts, in accordance with the ATEX Directive 2014/34/EU and the explicit instructions of the client (as a result of the risk assessment and the compilation of a specific questionnaire); **in this case, on the nameplate of the fan it is shown the**

ATEX string (detected and / or specified by the customer) composed by the symbol " Ex ” (protection against the risk of explosion), the equipment group, the usage area / category (protection from the type of potentially explosive gas or dust) and the indication of the temperature class within which is allowed the operation of the fan.

PLEASE NOTE THAT:

Areas with a potentially explosive atmosphere must be signaled by displaying the following sign.

Annex LI
(Legislative Decree no. 81/2008)

Picture 3 -Signboard for ATEX zones

Before commissioning of electrical and non-electrical ATEX classified machinery, the user must have prepared the "explosion protection document". Below is shown for convenience of Art. 294 of Legislative Decree no. 81/2008.

Document for protection against explosions

1. Carrying out the obligations listed in Article 290, the employer Must develop and keep updated a document, called the "explosion protection document".

2. The document referred to in paragraph 1, in particular, must specify:
a) which explosion risks have been determined and assessed;
b) that appropriate measures will be taken in order to guarantee maximum protection;
c) whose places have been classified in the areas listed in Annex XLIX;
d) what are the areas in which they apply the minimum requirements set out in Annex L;
e) that workplace and work equipment, including warning devices, are designed, operated and duly maintained with regards for safety;
f) that, under Title III, were adopted measures for the safe use of work equipment.

3. The document referred to paragraph 1 must be completed before the beginning of the works and revised when the workplace, work equipment or organization of the work undergoes significant changes, extensions or conversions.

4. The document referred to in paragraph 1 is an integral part of the risk assessment referred to in Article 1 of Decree 17.comma document. 81/2008;

In particular:
- It is forbidden to use the fans supplied by Ventinet for purposes and in presence of atmospheres other than those provided at time of order;
- A proper machinery (or partly completed machinery) usage, a strict observance of safety standards and a strict application of all precautions aimed to preventing risk situations, will avoid risk of accidents or injuries, and will allow the fan to work better and longer, as well as minimize all breakdowns.

ATTENTION:

Ventinet B.V. disclaims all objective and subjective liability, civil and penal, for any direct or indirect damages to people or things. This both in case of not application and / or non-compliance of the machinery (or partly completed machinery) working conditions stated in this Atex appendix and general manual, that in case of improper use of the Machinery (or partly completed machinery).

13.0 USER OBLIGATIONS

To complete the requirements of this Atex appendix, the user (Employer) is obliged to adapt the system to the following law provisions:

- European Directive 99/92/EC: “Minimum requirements for improving the safety and health protection of workers potentially at risk from explosive atmospheres”;
- D.L. n. 233/03 dated 12/06/2003: Together with this DL, it has been added the Title (VIII - ii) to the D.L. n. 626/94 named: ”Protection from explosive atmospheres”, which then became Title XI of D.L. 81/2008 started on the 15th of May 2008.

It is forbidden to use goods and equipment which may in turn be sources of ignition.

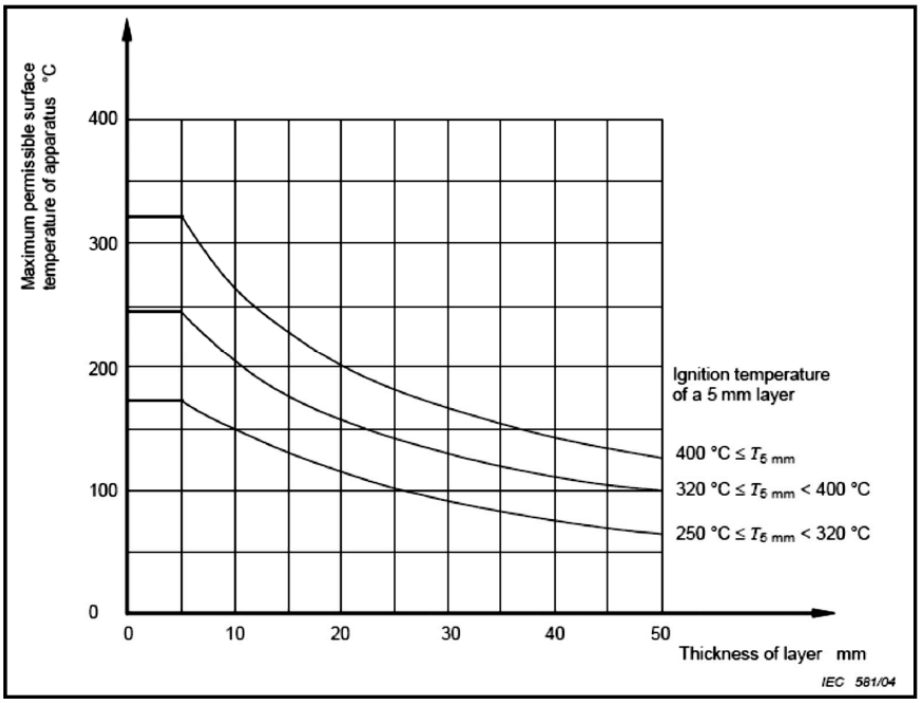
NOTICE: ANY CHANGES OR MODIFICATIONS TO THE FAN OR TO ANY OF ITS PARTS AND ANY CHANGES OR MODIFICATIONS TO THE MACHINERY (OR PARTIALLY COMPLETED MACHINERY) AREA OF PLACEMENT, IMPLIES, TO THE USER, THE OBLIGATION TO MAKE A NEW RISK ASSESSMENT.

14.0 ORDINARY MAINTENANCE

In addition to the scheduled maintenance from normal instructions contained into the Atex appendix and general manual, all ATEX fans require paying special attention to dusts deposits on flat surfaces. All fans object of this technical supplement, are designed to avoid causing inflammation of dust deposits that form on their surface. Surfaces' temperatures are substantially lower than the temperatures at which the deposited dusts begin to burn (TSup<125 [°C]). Good rule is, however, to minimize dust accumulations on the machine and, in any case, prevent that it exceed 5 [mm] of thickness. It is therefore recommended to calculate the correct numbers of air renewals per hour for the environment where the machinery (or partially completed machinery) are located and to plan periodic cleaning interventions at intervals, increasing the frequency if the environment is dusty. It is important to remember that the dust layer thickness is a source of reduction of the thermal exchange capacity and, consequently, the cause of detrimental heat accumulation for the machinery itself.

With the dust thickness increase, as can be verified from the graph shown in Figure 3, **the dust ignition temperature decreases and this increments the risk of explosion**. The air displacement generated by the fan can, in some cases, causes the deposition of dust in the building, for this reason, as stated in the manual of use and maintenance, it is necessary to periodically clean the impeller and the cochlea interior. Machinery (or partially completed machinery) object of this technical file and their protection systems are designed in such a way that all the cleaning interventions are simple, easy and of short duration.

For all cleaning procedures is recommended to follow the manufacturer's instructions contained into the relevant section of the machinery use and maintenance manual.



Picture 4 - Dusts Ignition temperature vs deposited layer thickness.

15.0 CHANGES AND REPAIRS

Modifications and repairs to machinery classified according to ATEX directives must be done mandatory by the manufacturer or by authorized personnel, trained and technically aware of the risks of explosion.

Any modification or repair performed differently from as stated above, immediately invalidates the certification and fan's security guarantee, transferring to the user all the responsibility.

All repairs shall be recorded by:
- Manufacturer;
- Repairman;
- Client/User.

All the spare parts used must be original, certified and provided by the manufacturer, penalty the immediate termination of the fan's security guarantee and the immediate taking sole responsibility of the user.