



Hazardous Locations

Air/Gas Compressors & Vacuum Pumps

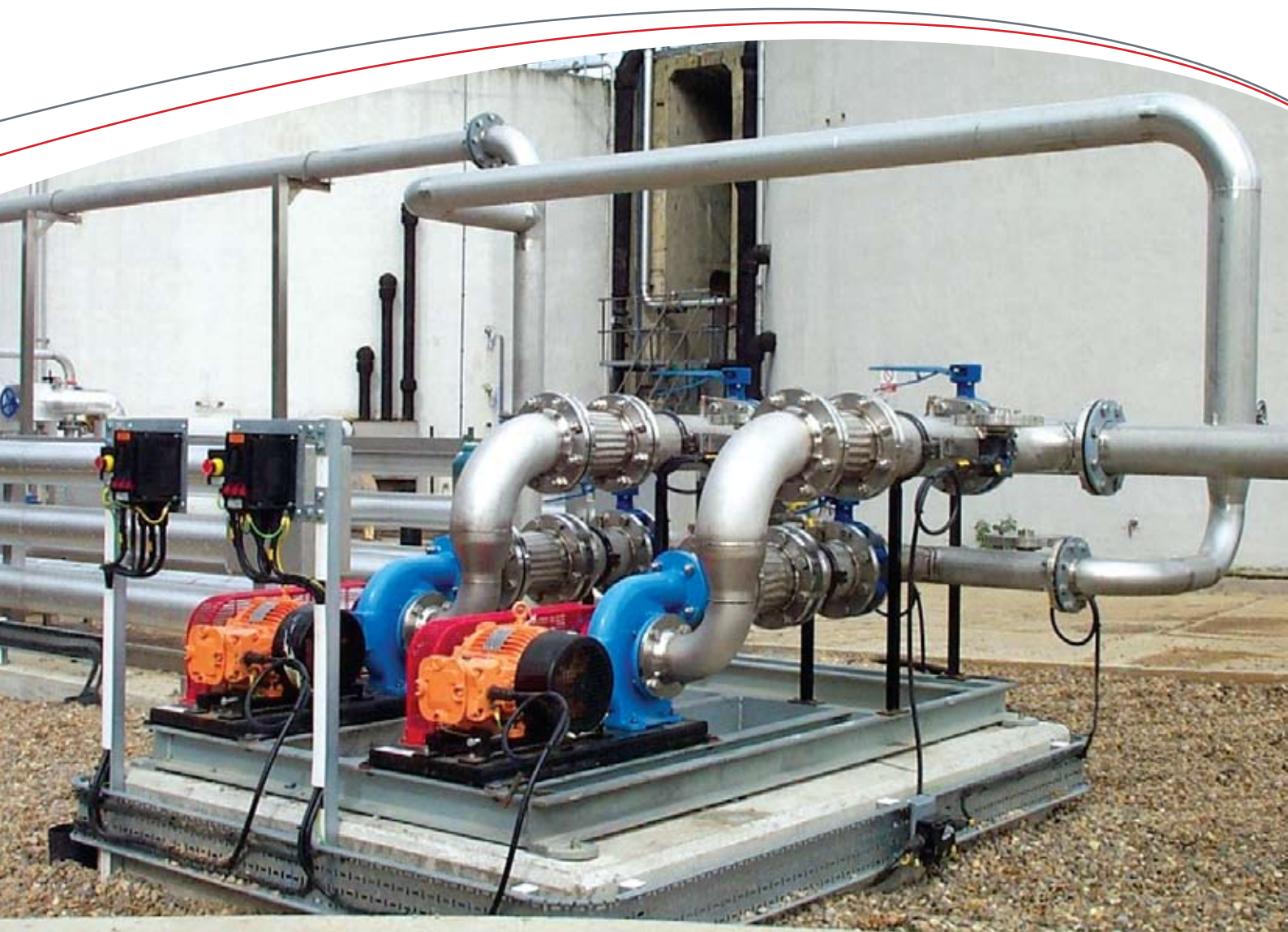
Gas Compressors, Gas Boosters, Air Blowers And Vacuum Pumps For Hazardous Locations

Utile Engineering is a leading manufacturer of gas compressors, gas boosters air blowers and vacuum pumps for the global industrial market.

Our products are used in almost every industrial activity including waste water treatment, building services, general processing and manufacturing.

We have 90 years of technical and design experience in this most specialised market and are able to ensure the correct selection of compressor for any application, taking into account the two most important factors to be considered - safety and economy.

- All compressors and boosters are of the highest quality, built to the latest national and International standards
- The compressors and boosters are operated in hostile environments throughout the world, safely and efficiently delivering gas with minimal attention over long periods



Atex Directive 94/9/ec

General

A potentially explosive atmosphere is one which **could** become explosive under certain conditions (the danger is a potential one).

An explosive atmosphere is one where a mixture with air, under atmospheric conditions of flammable substances in the form of gas, vapour, mist or dusts exist in such proportions that they can be ignited by excessive temperature, arcs or sparks (the danger is a real one).

ATEX

ATEX (ATMosphères EXplosibles) is the European Directive 94/9/EC. It applies to all equipment either electrical or mechanical used in hazardous atmospheres containing both dust and/or gas. The directive was introduced in 1994 and allowed a ten-year period for introduction. All new equipment manufactured, or equipment commissioned after 30 June 2003 to be situated in an explosive or potentially explosive must comply with ATEX.

The main purpose is to remove barriers to trade throughout the European Community. It also lays down specific requirements for users of such equipment.

The essential elements of ATEX involve: -

Notified Bodies, Standards, Conformity Assessment, Marking and Documentation.

The ATEX Directive is complementary to other directives such as Machinery Directive, Low Voltage Directive and Electromagnetic Directive. To show compliance with any of these directives, equipment is CE-marked accordingly. The 'USE' Directive (1999/92/EC) which sets down the requirements for safety and health protection of workers potentially at risk from explosive atmospheres further complements it.

Notified Bodies

These were previously referred to as Testing Authorities. The notified body provides approval and certification to the appropriate standard. This is mandatory for category 1, though categories 2 and 3 only need to be subject to internal control.

Standards

Standards must be current. This may mean, as with dust, entirely new standards. In the case of others, the standards have remained the same in substance, the latest editions contain only small detail changes.

Equipment Categories

Equipment Categories are another change, which has been introduced. Equipment will now have a category number appropriate to the zone for which it is intended to operate (see table in machine data plate).

Zones remain the same as previously for gas but in the case of dust, a new system using zones 20, 21 and 22, has been introduced.

Certification

Certification by a Notified Body is only mandatory for equipment category 1. For categories 2 and 3 equipment manufacturers are allowed to issue their own certificate of compliance.

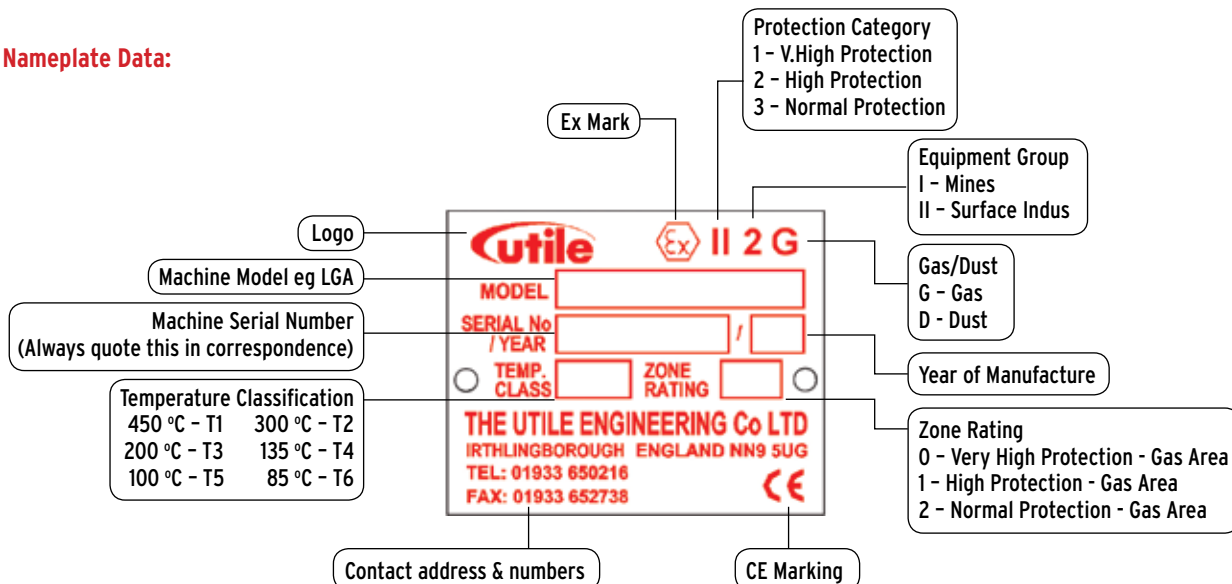
Documentation

Specific installation and maintenance instructions must be supplied for ATEX equipment.

Marking

This is the area of greatest visible change and is detailed below.

Nameplate Data:



Concepts

Flashpoint Vs Auto Ignition Temperature

Auto Ignition Temperature is the temperature at which a gas, vapour or mist will ignite **without the presence of a spark or flame**. The temperature at which ignition occurs due to a spark or flame is known as the **Flashpoint** - see examples on the right.

Machine selection must therefore ensure that the maximum surface temperature class must not exceed the **Auto Ignition Temperature** of the explosive mixture.

Temperature Considerations

The minimum temperature at which a gas, vapour or mist ignites spontaneously, at atmospheric pressure, is known as the **Auto Ignition Temperature**. To avoid the risk of explosion, the temperature of any part or surface of the compressor or booster exposed to the surrounding atmosphere must always remain below the **Auto Ignition Temperature** of the mixture.

The classification of the maximum surface temperature is detailed on the right.

Groups

Equipment for potentially explosive atmospheres is divided into: -

Group I - Mines

Group II - All potentially explosive atmospheres other than mines

Categories and zones

The degree of danger varies from extreme to rare. Hazardous areas are classified into three Categories and six Zones as follows: -

Category 1 - Zone 0 is which an explosive gas/air mixture is continuously present or present for long periods.

Category 2 - Zone 1 is which an explosive gas/air mixture is likely to occur in normal operation.

Category 3 - Zone 2 is which an explosive gas/air mixture is not likely to occur in normal operation and if it occurs it will only exist for a short time.

Flashpoint Vs Ignition Temperature		
Gas / Vapour / Liquid	Flashpoint	Auto Ignition Temperature
Acetal	-20°C	230°C
Acetadol	66°C	245°C
Acetone	-18°C	535°C
Benzyl Alcohol	100°C	435°C
Benzene	-17°C	560°C
Petrol	-45°C	220°C

Temperature Classification	
Temperature Class	Maximum Surface Temperature (°C)
T1	450
T2	300
T3	200
T4	135
T5	100
T6	85

Category 1 - Zone 20 is which a combustible dust/air mixture is continuously present or present for long periods.

Category 2 - Zone 21 is which a combustible dust/air mixture is likely to be present in normal operation.

Category 3 - Zone 22 is which a combustible dust/air mixture is not likely to occur in normal operation, but if it is present it will only exist for a short time.

By implication, an area that is not classified Zone 0, 1, 2, 20, 21 or 22 is deemed to be a non-hazardous or safe area.

Properties of some gases, vapours and liquids			
Compound	Ignition Temp. (°C)	Temp. Class	Apparatus Group
Ammonia	630	T1	II
Benzene	560	T1	II
Butane	365	T2	II
Butene	440	T2	II
Carbon Monoxide	605	T1	II
Chloromethane	625	T1	II
Diabutyl ether	185	T4	II
Dioxane	379	T2	II
Ethane	515	T1	II
Ethanol	425	T2	II
Formaldehyde	424	T2	II

* Industrial Methane includes methane mixed with not more than 15% by volume of hydrogen.

Properties of some gases, vapours and liquids			
Compound	Ignition Temp. (°C)	Temp. Class	Apparatus Group
Hydrogen Sulphide	27	T3	II
Kerosene	210	T3	II
Methane (Firedamp)	595	T1	I
Methane (Industrial)*	-	T1	II
Methanol	455	T1	II
Natural Gas	700	T1	II
Pentane	285	T3	II
Propane	470	T1	II
Town Gas**	-	T1	II
Xylene	464	T2	II

** Containing not more than 57% by volume of hydrogen and not more than 16% by volume of carbon dioxide, the remainder being a mixture

Utile Engineering Atex Directive Statement

Utile has been through the process of complying with the aforementioned directive for both the Sliding Vane and Centrifugal machines.

Utile's machines have all been classified Group II, Category 2, both internally and externally. This means they can be used in Zone 1 environments, where an explosive atmosphere is likely to be present frequently or for long periods of time. If a Utile machine is to be installed, in an area where an explosive atmosphere could arise, it is assumed a Zone 2 classification is to be put in place, approximately 1.5 metres around the machine. The explosive atmosphere referred to, is one generated by the possibility of gas leaking from inside of the machine to the outside atmosphere, in the quantities needed for an explosion.

Under the 'USE' directive (1999/92/EC) all employers must carry out an assessment of their workplace in line with the directive and classify as stated in the directive

Due to the strict nature of these new directives conditions of use have been introduced concerning gases allowed to be used, maximum ambient operating temperatures and other operating conditions. All conditions can be found in the instruction manuals accompanying the machines or alternatively they can be requested from the sales department.

Utile confirms that the temperature classes on the nameplates of the machines are specific to that machine although for compliance the worse case has been considered. These tests have been carried out under normal operating conditions, allowing for frequently occurring disturbances or operational faults.



For the installation and operation of the machines, due attention must be paid to Utile's instruction manuals while referring to the information on the nameplate of the machine, in addition to any other generally applicable regulations.

Although all of Utile's machines have been rated, as Group II, Category 2, any assembly of parts that Utile may supply, is not guaranteed to bear the same rating unless specified at the time of order. In this case, the lowest rated piece of equipment will be assumed to be the rating of the assembly.

The information contained in this leaflet is only to be used as a rough guide, and not as an official document.