ATEX SOLUTIONS
FROM AERZEN
Positive Displacement Blowers, Rotary Lobe Compressors and Screw Compressors, built in accordance with Directive 2014/34/EU
AERZEN. YOUR PARTNER IN EXPLOSION PROTECTION COMPLIANCE.

Directive 2014/34/EU finds increasing application in chemical and process technology industries. The law entered effect on December 12, 1996; see also the eleventh regulation of the product safety law (explosion protection regulation). Beyond supporting the crucial priority of safety and consumer protection, standardising requirements across Europe will promote the free exchange of goods within the EU. It is increasingly important that manufacturers make the following clear to their customers prior to selecting the equipment: explosion protection must be planned for in advance.

Two Directives – A Single EU-wide Approach to Protection.

- ATEX Product Directive 2014/34/EU (ATEX 114)
- ATEX Worker Protection Directive 1999/92/EC (ATEX 137)

The ATEX Product Directive 2014/34/EU regulates the commercialisation of products intended for use in areas at risk of explosion. The primary goal of the product directive is to protect persons who work in explosion-prone areas, or in areas that could be affected by explosions. Since the directive's entering effect at the end of 1996, only those devices, components and protective systems that comply with ATEX Product Directive 94/9/EC, or respectively its revised version 2014/34/EU, may be commercialised for use in areas at risk of explosion.

By comparison, the ATEX Worker Protection Directive requires that employers (plant management) fulfill or comply with certain requirements pertaining to the health protection and safety of employees who are exposed to potentially explosive atmospheres. Plant managers are required to include an explosion protection plan as part of their risk assessment and to divide areas with potentially explosive atmospheres into zones.

The Ex-Design You Need.

AERZEN positive displacement blowers, rotary lobe compressors and screw compressors are considered “Equipment” according to Directive 2014/34/EU. All AERZEN machines, components, and protective systems fall under Equipment Group II (Trade, Industry). Depending on their application, they are divided into three categories. We take the following important information into account when designing machines that will completely satisfy your safety requirements:

- Ex-zone
- Type of gas or dust
- Internal zone (pipeline, container, etc.) and/or external zone (surrounding area)
- Explosion group
- Temperature class (for gases) and/or ignition temperature (for dust)
- Frequency inverter operation yes/no
- Ambient temperature

Equipment Categories 1 to 3.

<table>
<thead>
<tr>
<th>Equipment Group II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment for industrial use in Ex-areas: hazard from mixtures of air and flammable materials in the form of gases, vapours, mists, or dusts</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Equipment category according to EU directive</th>
<th>Category 1</th>
<th>Category 2</th>
<th>Category 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazard</td>
<td>Constant, frequent, or even longer periods (&gt; 1000 h per year)</td>
<td>Occasional, random (10 to 1000 h per year)</td>
<td>Inrequent and short duration (&lt; 10 h per year)</td>
</tr>
<tr>
<td>Safety level</td>
<td>Very high</td>
<td>High</td>
<td>Normal</td>
</tr>
<tr>
<td>Zone designation</td>
<td>Zone 0</td>
<td>Zone 20</td>
<td>Zone 1</td>
</tr>
</tbody>
</table>

Dust or Gas: the Ex-atmosphere.

- Permanent hazard
- Hazardous conditions during normal operation
- Hazardous conditions limited to system failure (temporary)

ATEX is a contraction from the French “ATmosphère EXplosible” and is used for the European directive covering equipment and protective systems used in areas at risk of explosion.
Explosion Groups and Temperature Classes.

<table>
<thead>
<tr>
<th>Temperature classes</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ignition range of the explosive mixture</td>
<td>300°C – 450°C</td>
<td>200°C – 300°C</td>
<td>195°C – 200°C</td>
<td>100°C – 195°C</td>
<td>85°C – 100°C</td>
<td></td>
</tr>
<tr>
<td>Max. surface temperature*</td>
<td>450°C</td>
<td>300°C</td>
<td>200°C</td>
<td>195°C</td>
<td>100°C</td>
<td>85°C</td>
</tr>
</tbody>
</table>

Explosion groups for gases

- **I**: Methane
- **II A**: Acetone, ammonia, methane, methanol, propylene, toluene
- **II B**: Liquefied gas (Coal gas)
- **II C**: Ethylene, Hydrogen sulfide

Explosion groups for dust

- **III A**: Flammable lint
- **III B**: Conductive dust with specific electrical resistance > 10³ Ωm
- **III C**: Conductive dust with specific electrical resistance < 10³ Ωm

* Defined by how the equipment or equipment components are to be used

Typical labelling in accordance with Directive ATEX 2014/34/EU.

- **Ex-marking sign**: for prevention of explosions (hexagon symbol)
- **Equipment group**: I = Mining  
  II = Trade and Industry
- **Equipment category**: 1 = Very high level of safety  
  2 = High level of safety  
  3 = Normal level of safety (internal I/external without)
- **Substance group**: G = Gas  
  D = Dust
- **Identification code**:  
  **Explosion group**: Non-conductive dust
- **Surface temperature**: <200°C
- **Equipment Protection Level (EPL)**: T300°C  
  ID
INDUSTRIES AND TYPICAL APPLICATIONS.

Environmental technology
- Biogas compression
- Natural gas compression
- Gas feed

Food and plastics industries
- Pneumatic conveying
- Silo loading and unloading

Chemical and pharmaceutical industries
- Gas conveying
- Degasification

Refineries

Power plants
MADE BY AERZEN. EFFICIENCY AND MAXIMUM SAFETY IN EVERY ZONE.

For years, compressors and blower packages “made by AERZEN” have been regularly used in highly critical areas. The know-how and experience that we have gathered over the decades regarding practically every type of application are reflected especially in the processes that fall under the ATEX directive. AERZEN offers its customers a range of solutions for ATEX zones that is unique in its scope and effectiveness: A good starting point when it comes to meeting ever more stringent requirements safely and economically.

Made to Order: Complete ATEX Solutions from a Single Source.
With AERZEN products, customers benefit from a comprehensive solution to all their ATEX-compliant equipment needs. Our ATEX specialists will design the proper assembly for you – including all associated features (see below). The design includes all necessary documentation and accessories to meet the conditions of ATEX Product Directive 2014/34/EU. Moreover, our engineers will review and, if necessary, implement further customer requests pertaining to equipment design in view of complying with Directive 2014/34/EU (ATEX). In addition to engineering experience based on decades of work with facilities of all sizes, we offer our customers a number of other significant advantages:

- Comprehensive advice from the AERZEN team of experts
- Equipment conforming to Directive 2014/34/EU
- Complete documentation
- Adherence to legal requirements
- Complete solutions from a single source

Remarkable Diversity: the ATEX portfolio from AERZEN.

Sound advice is the key to success. This is especially true when planning for applications in Ex-areas. This is why we place great emphasis on careful preparation. Our engineers will discuss the details of your project with you well in advance and assemble all ATEX-relevant information (further details on page 3). That is the prerequisite for meeting ATEX zone requirements when designing equipment suited to a set application.

Positive pressures

<table>
<thead>
<tr>
<th>ATEX equipment</th>
<th>Internal Ex-atmosphere (intake from Ex-zone)</th>
<th>External Ex-atmosphere (Ex-free intake)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 21 2 22</td>
<td>1 21 2 22</td>
</tr>
<tr>
<td>Delta Blower</td>
<td>x x x x x</td>
<td>x x x x x</td>
</tr>
<tr>
<td>Delta Hybrid</td>
<td>x x x x</td>
<td>x x x</td>
</tr>
<tr>
<td>Delta Screw</td>
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Negative pressures

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ATEX Solutions from AERZEN: Always an Idea ahead.
Regardless of whether it is to be used for positive or negative pressure applications, high-performance AERZEN equipment is the right solution for your ATEX zone: TÜV tested, of course. According to product group and zone type, our technologies have different designs. Features may include:

- Zone separation filter
- Special documentation
- Use of specialised materials for components in contact with the medium
- Ex-instrumentation
- Vibration monitoring
- Spark arrester
- Special motors designed for a specific zone

Example: vacuum pneumatic conveying.
AERZEN zone separation filter:

- Zone separation filter
- Special documentation
- Use of specialised materials for components in contact with the medium
- Ex-instrumentation
- Vibration monitoring
- Spark arrester
- Special motors designed for a specific zone
The following components can be specifically configured for ATEX zones:

- Drive motor
- Belt drive
- Instrumentation, including pressure differential, vibration, and temperature monitoring
- Housing materials
- Suction-side components (filter silencer, sentinel or zone separation filter)
- Additional labelling, operation manuals and declaration of conformity in accordance with Directive 2014/34/EU
- Discharge silencer as spark arrester
- Additional component used on compressors: coupling

**Advantages of an integrated AERZEN solution:**

- Customer savings
- Maintenance-free (spark arrester)
- Minimal pressure loss
- Energy-efficient
- Compact
- Discharge silencers free of absorption material
- 100% safe
AERZEN. Compression - the key to our success.

AERZEN was founded in 1864 as Aerzener Maschinenfabrik. In 1868, we built Europe’s first positive displacement blower. The first turbo blowers followed in 1911, the first screw compressors in 1943, and in 2010 the world’s first rotary lobe compressor package. Innovations “made by AERZEN” keep driving forward the development of compressor technology. Today, AERZEN is among the world’s longest established and most significant manufacturers of positive displacement blowers, rotary lobe compressors, screw compressors and turbo blowers. AERZEN is among the undisputed market leaders in many areas of application.

At our 50 subsidiaries around the world, over 2,500 experienced employees are working hard to shape the future of compression technology. Their technological expertise, our international network of experts, and the constant feedback we get from our customers provide the basis for our success. AERZEN products and services set the standard in terms of reliability, stability of value and efficiency. Go ahead - challenge us!