

# PYROBAN

## **ATEX Forklift Trucks - A Buyer's Guide**

### **WHITE PAPER**

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# A BUYER'S GUIDE

The ATEX Directives have been around for many years but do buyers understand what “ATEX compliant” means in the real world and should they look deeper when asked to supply or purchase ATEX compliant forklift trucks?

## HOW DO THE ATEX DIRECTIVES INTER-RELATE?

### ATEX 1999/92/EC - for end users

This Directive was introduced to rationalise the approach taken by all EU member states in regards to assessing and managing their risks associated with conducting operations within potentially explosive atmospheres.

End users need to:

- ✓ analyse and define their operation into zones
- ✓ manage the risks through effective controls being in place such as ensuring operators are suitably trained
- ✓ source suitably rated equipment for the zone classifications
- ✓ ensure equipment is operated according to the manufacturer's instructions
- ✓ ensure equipment is maintained appropriately to sustain the level of safety required.

Each member state transposed this ATEX Directive into national law according to the national processes. For example in the UK the DSEAR regulations specify the end users responsibilities to meet their ATEX Directive obligations.



Directive 1999/92/EC requires the user to source and use suitably rated equipment compliant to ATEX Directive 2014/34/EU (formerly 1994/9/EC).

### ATEX 2014/34/EU - for manufacturers

This Directive is specific to the manufacturers of product (individual pieces of equipment or components) intended for use in potentially explosive atmospheres and outlines the manufacturer's responsibilities in regards to the design and manufacture of such equipment.

The Directive also defines how the products are to be certified and the markings which must be applied to show what level of “safety” has been achieved. The Directive is also classed as a CE marking Directive which means that products complying with the Directive must have a CE marking on them.

# GIVEN THERE IS A CLEAR LINK BETWEEN THE “USER” DIRECTIVE AND THE “MANUFACTURER” DIRECTIVE IS EVERYTHING STRAIGHT FORWARD?

In theory, yes. All products have a CE marking which is a declaration of compliance to the ATEX Directive in its own right.

The product also has a label defining:

- the equipment category
- its suitability for use involving gas or dust or both
- the gas and/or dust groups the product is suitable for
- maximum temperature the product will reach in operation
- ambient temperature ranges it is suitable for

The product will also be issued with an EU Declaration of Conformity stating the compliance to the ATEX Directive and the basis of the product conformity described above.

## Is 3rd party certification required?

Buyers and end users may believe that every product is certified by a 3rd party and the manufacturer is audited as well. Whilst this may seem logical for explosion safety this isn't the case for a range of products manufactured to the ATEX Directive.

The ATEX Directive does not mandate 3rd party certification and does not mandate manufacturer facility auditing for all the types of product.

Buyers may be surprised by the fact that no independent verification is required at all for a significant range of products, individual components or equipment.



# WHAT ARE THE REQUIREMENTS FOR AN ATEX COMPLIANT (“EX”) FORKLIFT TRUCK?

An EX forklift truck is required to operate inside classified areas, but what does this mean in terms of certification and manufacturer facility auditing?


A forklift truck is recognised as an assembly of electrical (motors, controllers, displays, sensors, lights, sounders etc.) and non-electrical (internal combustion engine, hydraulic pump, valves, transmissions, axles, brakes, chains, rollers etc.) parts.

The ATEX Directive differentiates whether the individual part is suitable for use in Zone 1, 2, 22 or 21 and whether they are electrical or non-electrical.

Table 1 shows the requirements for the individual components that make up an EX forklift truck.



Zone of use	Electrical equipment	Non-electrical equipment	IC engine
Zone 1 / 21	3rd party product certification EN ISO 9001 + EN 80079-34 facility controls in place 3rd party facility certification (ATEX QAN)	Manufacturer self-declaration Internal control of production (EN ISO 9001)	3rd party product certification EN ISO9001 + EN 80079-34 facility controls in place 3rd party facility certification
Zone 2 / 22	Manufacturer self-declaration Internal control of production (EN ISO 9001)	Manufacturer self-declaration Internal control of production (EN ISO 9001)	Manufacturer self-declaration Internal control of production (EN ISO 9001)

 The ATEX Directive is not clear how to interpret the requirements for the final ATEX compliance of the final forklift truck. The European Commission issued formal Guidance on this point which confirms that the forklift truck is not a piece of equipment in its own right but is classed as an assembly of separate parts which has a profound impact on the certification requirements.

The requirements for the final certification are therefore summarised in Table 2.

Zone of use	Certification Requirements	Facility Requirements
Zone 1 / 21	A copy of the manufacturer's Technical Construction File is filed with a Notified Body (no technical review undertaken) Manufacturer issues ATEX EU DoC, applies CE marking to truck chassis	No specific requirements
Zone 2 / 22	Manufacturer's TCF is held for 10 years internally Manufacturer issues ATEX EU Declaration of Conformity, applies CE marking to truck chassis	No specific requirements

**Table 2. Requirements for forklift truck certification and manufacturer's facility controls**

We said earlier that the ATEX Directive does not mandate for 3rd party certification. However, at both individual product level and for the final forklift truck the ATEX Directive makes the provision for an optional 3rd party verification or 3rd party certification. The manufacturer may instigate either to support and promote the quality and integrity of their product. The buyer may also request 3rd party certification to help manage his risk rather than just to rely solely on the manufacturers declaration.

The above requirements apply whether the EX forklift truck comes from an OEM, who designed the forklift specifically to be ATEX compliant, or if a standard forklift truck is converted to the ATEX Directive requirements. The level of final certification and facility controls is the same.

## HOW IS THE NORMAL FUNCTION OF THE TRUCK MAINTAINED WHILST ACHIEVING ATEX COMPLIANCE?



With ever-changing technologies and drive for improved operator experience, improved safety and fault detection, improved reliability, ease of maintenance and more data being available to the operator or after sales, the electrical control systems on forklift trucks have continued to grow in complexity.

Whether building an EX truck from first principles or converting a standard truck, the electrical control system is one of the largest challenges to satisfy both normal truck requirements and ATEX requirements.

A range of solutions are normally required to satisfy both requirements depending on the specific component function and the intended zone of use.

For zone 2 and zone 22, normal operating conditions are taken into account to determine how to protect the part.

For zone 1 and zone 21 normal operating conditions AND foreseeable fault conditions need to be addressed.

With more sophisticated control systems, electronics circuits are found throughout the forklift parts. For example, fingertip control foreseeable faults could be:

- a fault occurring at the main controller causing either the controller or the fingertip control circuit to create an ignition source (spark or high temperature).
- a fault occurring at the fingertip control circuit causing an ignition source in the fingertip device or main controller.

Over simplifying the possible ignition sources can lead to partial Ex protection which would not normally be checked by a 3rd party. The Ex circuit therefore needs to be addressed in both scenarios.

Protecting such devices using conventional techniques can cause signal degradation which then causes controller error codes preventing the truck working.



**Zone 1**

## WHAT ABOUT CE MARKING?

No matter how the EX forklift truck is produced, the ATEX guidance is clear that the final truck must carry a **single CE** marking and a single EU Declaration by the person placing the EX forklift truck into the market.

For converted forklift trucks this means the CE marking and declaration of the standard truck is used as the basis for the EX conversion and then **a new CE marking** will replace the original CE marking and a new EU Declaration will be issued by the person placing the EX forklift truck into the market.

The declaration will state compliance to ATEX and any other relevant Directives for the complete forklift truck.





## HOW TO CHOOSE A SUPPLIER FOR A FORKLIFT TRUCK

There are many factors to consider when selecting any supplier.

### **Commercial factors**

Price, lead time, customer service, after sales coverage are important aspects from a commercial perspective.

### **ATEX confidence factors**

Suppliers providing product only for use in zone 2 or zone 22 areas have no requirement for 3rd party involvement.

From an ATEX confidence perspective, if a supplier designs and manufactures their own electrical product for use in zone 1 or zone 21 areas, it may provide a further level of confidence about the self-declaration process as the supplier will have 3rd party product certifications. They will have additional procedures in place above the requirements of ISO9001 focused on managing the ATEX requirements and their facility will be regularly audited by a 3rd party to maintain their ATEX QAN certification. However, the 3rd party audit only verifies how the separate parts are manufactured and does not check how the final truck is protected regarding the thoroughness of the ignition source assessment or the depth of prevention applied for the electrical control system or non-electrical elements.

Buyers and end users rely on manufacturer self declaration for the final truck.

## ABOUT PYROBAN

Pyroban provide explosion protection solutions for materials handling equipment and diesel engines.

For nearly 50 years we have been at the forefront of the industry developing products to protect your people, your site and equipment when operating in hazardous & added safety areas.

## QUALITY

Additional to the ISO9001:2015 quality standard certification, each Pyroban Group company attains the required level of 3rd party certification for the business markets it serves including ATEX, IECEx, GB and NEC.

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