

EcoQuip ATEX FAQ's

What is ATEX, why is it required?

The ATEX directive is a European law that covers equipment and Protective systems intended for use in potentially explosive atmospheres. Customers classify their work area and need to use equipment that is appropriately rated for that location.

What are the EcoQuip ATEX markings? What do they mean? With what specific standards does it comply?

CE **Ex** **II 2G c ia IIA T3 X**

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|-----------|---|----------------------|
| CE | Complies with European ATEX Standards | |
| Ex | European Community mark for products used in potentially explosive areas | |
| II | Equipment Group: Surface Industry | |
| 2G | Equipment Category: Use in Zone 1 or Zone 2 | |
| c | Constructional Safety (Mechanical) | } Type of Protection |
| ia | Intrinsic Safety (DataTrak) | |
| IIA | Gas Group: Propane | |
| T3 | Temperature Classification: 200°C | |
| X | Special conditions for safe use. Listed in the warning section of the operations manual (334142,334143) | |

 WARNING	
	SPECIAL CONDITIONS FOR SAFE USE <ul style="list-style-type: none">• Ground all equipment in the work area. See Grounding Instructions.• All label and marking material must be cleaned with a damp cloth (or equivalent).

The specific ATEX standards the EcoQuip ATEX system complies with are EN13463-1, EN13463-5. The specific ATEX standard for the DataTrak is EN 60079-11 for intrinsic safety.

Does the whole system have ATEX approval or just the components?

The entire EcoQuip ATEX system has ATEX approval. The specific part numbers are found in the manual.

Does the system really reach the 200°C (T3)?

The system will not reach 200°C (392°F) under normal operation. A maximum of 200°C temperature is only reached under a two fault condition within the DataTrak. The next highest temperature is achieved while in a runaway condition with a dry water pump. The maximum temperature the pump will reach is 135°C (275°F)

Where is the EcoQuip ATEX system approved for use?

The EcoQuip ATEX equipment has been approved for use in area classification Zone 1 and Zone 2 only. It is not approved for use in a Zone 0 location. This means the system is approved to operate in an explosive atmosphere consisting of a mixture of flammable substances that can form occasionally in normal operation. Figure 1 illustrates the differences between the area classifications.

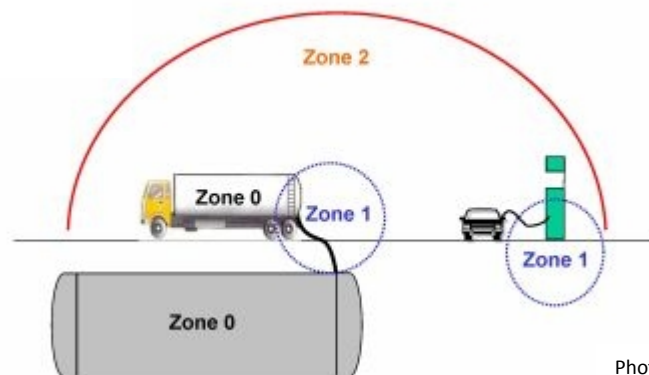


Photo Courtesy of Correge Sensors

Figure 1: Area Classification

Is the EcoQuip ATEX system intrinsically safe (IS) or explosion-proof? Is it Class 1 Division 1 for US / CAN?

The EcoQuip ATEX system is classified as non-electrical. It contains no explosion-proof components. It does contain an ATEX and Class 1 Division 1 approved IS DataTrak. The EcoQuip system does not fall under the Class/Division area classification in the US / CAN, it is classified as non-electrical.

The system is ATEX approved, but how about IECEx approval for International acceptance into hazardous location?

The EcoQuip ATEX system is classified as non-electrical. Currently IECEx (International Electrotechnical Commission) does not evaluate non-electrical equipment for use in hazardous location. Non-electrical is only recognized under the ATEX directive. Graco complies with this directive by self-assessing to EN13463-1 and EN13463-5 for non-electrical equipment for use in potentially explosive atmospheres. The EcoQuip does include a DataTrak that has also been approved for use in explosive atmospheres under the ATEX directive. The EcoQuip ATEX system is classified the same way as other non-electrical equipment at Graco similar to Xtreme Sprayers, Merkur Sprayers, etc.

What is different about the EcoQuip ATEX system compared to the ordinary location system?

The EcoQuip ATEX system does not have the dual electric/pneumatic blast control switch connections. It only has the pneumatic option. Additional grounding of the system must be completed. For the additional grounding a stud is provided on the back of the blast cabinet that must be connected to Earth Ground. See Grounding Instructions in the manual.

Is the EcoQuip system non-sparking? Is it approved for use in a potentially explosive atmosphere?

The EcoQuip ATEX equipment has been approved for use in area classification Zone 1 and Zone 2 only. Graco does not claim the EcoQuip system is non-sparking. Many tests have been conducted to determine if the sparks caused by the abrasive grit striking against the substrate are considered an ignition source. American Petroleum Institute (API) Recommended Practice 2027 states "Sparks generated by abrasive blasting are typically not considered to be ignition sources as they are relatively low in heat energy and are cooled by the stream of blasting air or water. The blast stream also tends to disperse and dilute any flammable vapors present in the area where sparks occur, further reducing the potential ignition hazard."

Additionally Shell Research Ltd. conducted a test TRCP.2039 (Revised) to determine if the sparks caused by the abrasive grit striking against the substrate could be an ignition source. For this test, an apparatus was constructed that enclosed a blast nozzle, steel plate, spark plug, and gas inlets. This test used coarse and fine copper slag, and also steel shot as the abrasive grit. Abrasive grit was blasted at 100 psi onto a rusty steel plate creating visible sparks. During blasting, propane was metered into the apparatus at the low inflammable limit to the upper inflammable limit. Throughout the testing the spark plug was used to ignite the atmosphere to ensure a flammable air/grit/gas mixture. After multiple iterations of the gas inlet and blast inlet locations the sparks caused by the abrasive grit onto the steel plate did not ignite the

atmosphere. After testing the report states “The sparks produced by the grit streams were numerous but dull and they could only be observed in darkness. On no occasion did they ignite the inflammable gas mixture present in the test chamber. We believe that this could be because the sparks are of low energy and it is possible that they are cooled by the surrounding air before it reaches the explosive range.”

Can I blast all media in a potentially explosive atmosphere?

The testing conducted at the Shell Research Center used two copper slag abrasives representing both fine and course grade, and steel shot abrasive onto a steel plate. These results did produce sparks but did not ignite the explosive atmosphere. Using a softer abrasive such as sodium bicarbonate (soda) while blasting will not produce sparks the way harder abrasive will.

Is the EcoQuip ATEX system grounded from the blast nozzle to earth ground? Could static buildup create an ignition hazard?

The EcoQuip ATEX system is grounded from the blast nozzle through the blast hose back to earth ground. The system uses a conductive hose, couplings, and nozzle to ensure proper electrical bonding to the system. The grounding instructions in the operations manuals instruct users to properly ground the equipment. Additionally the manual states if the total resistance from the nozzle to earth ground exceeds 29 megaohms to replace the hose immediately. API RP 2027 states “A significant potential ignition hazard during abrasive blasting is the generation and accumulation of enough static electricity to produce an incendiary spark”. The static electricity is generated as abrasive flows through the system, hose and nozzle and strikes the substrate.

What is hot work and cold work, and what permit do I need when blasting with an EcoQuip ATEX system?

API RP 2027 definitions associated with abrasive blasting:

Hot work: *Any work that has the potential to produce enough thermal energy to provide an ignition source in an area where a potential exists for a flammable gas or vapor-in-air atmosphere in the explosive (flammable) range to occur*

Cold work: *Any work associated with abrasive blasting that does not have the potential to create a source of ignition*

API RP 2027 states “At a minimum, abrasive blasting shall always require issuance of a hot work permit”. This report in its entirety is referring to dry blasting. In at least one instance the Brunei Shell Petroleum Company has approved EcoQuip with a cold work permit. However, when using EcoQuip, determining the work permit type should be discussed for each application. With the Shell report CPDP07 conventional dry blasting was compared to vapor abrasive blasting on an offshore oil rig. Section 7.2 summarizes the findings for operational activities.

No.	Activity	Vapour Abrasive Blasting (VAB)	Conventional Dry Blasting (CDB)
1	PTW	COLD WORK permit	HOT WORK permit
2	Work category	This is categorized as cold work and hence no deferment on the platform productivity.	This is categorized as hot work. Wells need to shut down and it will affect the platform productivity.

Table 5 – Comparison of Vapour Blasting & Conventional Dry Blasting on Operational Activities

References:

- (1) API Publication 2027 (2007) – Ignition Hazards and Safe Work Practices for Abrasive Blasting of Atmospheric Storage Tanks in Hydrocarbon Service, 3rd ed.
- (2) Singleton, D. W. "Blast Cleaning in Inflammable Atmospheres." *Shell Research Ltd.* TRCP.2039 (Revised (February 1976).
- (3) Brunei Shell Petroleum Company (2014) – Final Inspection Report For Vapour Abrasive Blasting (VAB) on CPDP-07.