ENGINES AND EQUIPMENT FOR HAZARDOUS AREAS
50 YEARS
OF OIL AND GAS

Pyroban equipment can be found in all major oil and gas locations around the world. It is fitted in both safe and formally classified areas on drilling, production and well service equipment.

The Pyroban brand and values are synonymous with safety and quality.

1969
The Pyroban project began. A study into the effect of diesel engines ingesting hazardous atmospheres. A blueprint for safety was created.

1972
Company Incorporated. First mining and offshore powerpacks were prototyped and successfully series produced.

1983
Pyroban invents flameproof solutions for the then dominant Detroit Diesel 2 cycle engine range. Systems were manufactured for the expanding North Sea industry.

1999
First electronic diesel engine conversion kit and safety shutdown system developed by Pyroban.

2000
Pyroban kits tested for EN1834-1:2000 (ATEX) compliance.

2004
Pyroban launches 3GP Gas Detection for diesel engines and brings “active” gas detection principles and technology to solve exhaust flame trap maintenance problems.

2011
Caterpillar buys Pyroban. Significant investment in people, processes and facilities. Pyroban Oil and Gas focuses on developments for CAT products.

2017
Pyroban becomes an independent business owned by SEA.

Pyroban again offers ATEX solutions for all engine brands and re-ignites its heritage of innovation.
EXPLOSION PROTECTED ENGINE PACKAGES

EX SAFETY KITS AND COMPONENTS

EX SOLUTIONS & CERTIFICATION

SERVICE, SUPPORT, TRAINING AND PARTS
ENGINES IN HAZARDOUS AREAS - OVERVIEW

THE SCIENCE OF EXPLOSIONS

There is always a risk of a flammable hydrocarbon release in the oil and gas industry. When the release comes into contact with air and an ignition source, an explosion is a real risk.

Pyroban Ex Power solutions are designed to eliminate the ignition risk and keep your workers and assets safe.
Potential ignition sources on unprotected diesel engines include electrical, mechanical or static sparks, overspeed or flame transmission from inlet or exhaust, and hot surfaces.

**PYROBAN PROTECTION**

**CRITICAL CONSIDERATIONS**

1. **Air inlet shut-off Valve**
   Flammable gases in the atmosphere can be drawn in through the air intake along with air for combustion. This can result in flashbacks through the inlet and backfires in the exhaust. If the engine consumes flammable gas mixed with air and diesel fuel, engine overspeed can occur, which can lead to the engine running out of control. This can result in catastrophic failure of the engine, creating unprotected ignition sources.

2. **Air inlet flame arrestor**
   When gas is ingested, there is risk of the engine misfiring, leading to unburnt fuel mixture entering the exhaust system. This can be detonated from the heat of the exhaust and ignite the surrounding (now flammable) atmosphere.

3. **Water-cooled Turbocharger & Exhaust Manifold**
   Many surfaces on a diesel engine can exceed safe limits and become sources of ignition. These surfaces need to be protected to avoid the danger of explosion by ensuring surface temperature is below 200°C (T3).

4. **Thermal control & treatment**
   Thermal signature of engines and ancillary parts can be further reduced using our proprietary thermal coatings.

5. **Exhaust Gas Heat Exchanger**
   Cools the engine exhaust below 200°C (T3)

6. **Exhaust Flame Traps**
   Prevents back fire from the explosion proof exhaust system. Can be eliminated by using our certified SCS system.

7. **Spark Arrestor**
   Ensures that no exhaust-born hot particles escape into the atmosphere.

8. **Radiator**
   A choice of industrial or marine solder dipped radiators providing additional cooling capacity and corrosion resistance is available.

**Kit and Package solutions may also include:**
- Ex Battery
- Ex Starter
- Ex Electronic Control System
- Ex Certified ECM and engine electrical system
- Enclosures

**Certification**
All Pyroban products are certified, with some having tri-certification to ATEX 2014/34/EU, IECEx and NEC 505/NEC 500.
Pyroban safety kits for engines intended for Zone 2 areas include explosion proof inlet system and exhaust gas cooler with certified spark arrestor. Additional components are added according to the application.

Zone 2 explosion protection kits are available for the following engines:

**CAT** - C2.2, C7, C9, C15, C18, C32, 3406C, 3500C

**Cummins** - KTA 19, QSM-11, 6BT

**Deutz** - 1013, 1015

**MTU** - 2000 and 4000 series

**Volvo** - D7, D12

**DDC** - Series 60 and all 2 Cycle engines

**Perkins** - 400, 1000 and 1100 series

**JCB** - 444
Kit integration examples

Kits are provided with component level certification to enable the integrator to complete the certification and test process. Installation assistance and thermal imaging is also available and full training can be provided.
**Ex Alternators**
Catagory 2G IECEx and ATEX DC Battery charging alternators are designed for operation in classified hazardous areas to recharge your Ex Battery for starting and or ECM operation.

**Ex Alternator (power)**
The AC alternator (power) is Catagory 3G IECex and ATEX certified brushless, totally enclosed, fan-cooled, non sparking and twin bearing AC 400v Alternator with an output of 60kVA or 80kVA.

**Ex e Battery**
Catagory 2G Tri certified (ATEX, IECex and NEC 505) - Increased Safety offshore battery with flameproof isolator. Designed with corrosion and impact resistance in mind. The 12V 110AH and 24V 55AH units contain deep cycle batteries protected with a 50A MCB isolator.

**Airshut-off Valve**
The SVH Valve is a category 2G inlet shut-off valve available in 3” and 4” diameters and a choice of pneumatic, hydraulic and electronic actuation and available with and with out integral inlet flame arrestors. These can be installed in Zone 2 and Added Safety applications.

**Ex SIT**
ExSit is an EN1834-1:2000 certified double skin exhaust duct which allows the safe ducting of hot exhaust gases from an engine without the need for exhaust gas cooling. It can be deployed as part of an Added Safety risk management system or as part of a solution for Exp Diesel generators.
PCS2

PCS2 is our entry point Category 2G SIL2 certified ATEX and IECex Control system. It features HWT, HET, OS, LOP inputs in a rugged Exd enclosure and simple indication lights replacing Pneumatic systems.

Ex SCS

Ex SCS is our flagship category 2G SIL 2 rated safety control system. It answers a number of industry problems and prevents duplication of systems, by offering flametrap elimination, Safety control and engine control in one PLC based system. Customisation and process control available on request.

Bespoke enclosures

Our bespoke aluminium and steel Exd enclosures are available design to order. If you have a requiment to house starting contactors, battery chargers, or any arcing or sparking aparatus. we can design, supply and test the enclosure and it's contents.

Starter motor

Category 2G starter motors. We can offer standard designs for the most popular engine makes with ATEX and IEC-Ex Certification.

Spark Arrestors

A comprehensive range of spark arrestors suitable for a variety of applications. We supply three categories to a variety of lengths, diameters, pipe sizes and power ranges.
HAZPAK RANGE

PACKAGED ENGINES FOR HAZARDOUS AREAS

Pyroban HazPak engines are fully packaged engines all ready for use in hazardous areas.

CERTIFICATION AND TESTING

All Pyroban HazPak engines are certified, where applicable, to ATEX 2014/34/EU and NEC 505 / NEC 500.

With in-house test facility procedures and approval to national standards, Pyroban ensures quality at every step in the process.
Pyroban offers fully packaged Caterpillar, Cummins, Deutz, John Deere, MTU and Scania engines.

Below are some examples of our recent HazPak models:

**C4.4 TA**
Caterpillar HazPak
CCNR Stage 2, EPA T2 M
- 96bkW / 128bhp @ 1500rpm
- 112bkW / 150bhp @ 1800rpm

Emissions non-current
- 92 bkW / 123bhp @ 2200rpm

**C4.4 NA**
Caterpillar HazPak
CCNR Stage 2, EPA T2 M
- 45bkW / 60bhp @ 1500rpm
- 44bkW / 59bhp @ 1800rpm

Non-current EU II
- 52 bkW / 70bhp @ 2200rpm

**C7**
Caterpillar HazPak
IMO II, EPA T2 M, EPA T3 NR
- 158 bkW / 211 bhp @ 2200rpm

**C9**
Caterpillar HazPak
EPA and CARB T3 NR, EU IIIA NR, EPA T2 M, IMO II
- 227 bkW / 304 bhp @ 2200rpm

**3406C**
Caterpillar HazPak
Emissions non-current
- 336 bkW / 451bhp @ 2100rpm

**C15**
Caterpillar HazPak
IMO II, EPA T3 M, EU IIIA NR
- 376 bkW / 504bhp @ 1800-2100rpm

Power rating shown are Net inclusive of fan losses
All power ratings are approximate and are non binding
PYROBAN ENGINEERS QUICKLY MOBILISED OFFSHORE 24/7/365

Engineers carry all necessary medical certificates and survival training for local and international mobilisation.
ENGINEERING SUPPORT & PARTS

In addition to offshore support, engineer training can be provided and all customers are fully supported by Pyroban's technical team and parts supply.

MANUFACTURING EXCELLENCE

Pyroban products are manufactured in accordance to ISO9001:2015 quality standard certification. Driving a Zero-Defect culture.

Caterpillar ownership has brought many benefits to our business. The investment in our people, processes and facilities has elevated our capabilities.

Pyroban looks forward to the next chapter serving customers directly with class leading Ex products, services and support, delivered on time.
Enabling people to work safely every day