







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 3GPTM 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 the Longacre Group. Pyroban again offers ATEX solutions for all engine brands and re-ignites its heritage of innovation.

2019

Ex-SCS[™] launched. IECEx and ATEX certified flame arrestor elimination with diesel engine control and management.

2020

Pyroban Everclear[™] launched. Long-life ATEX certified hot side exhaust flame arrestors with 1000 hour intervals.





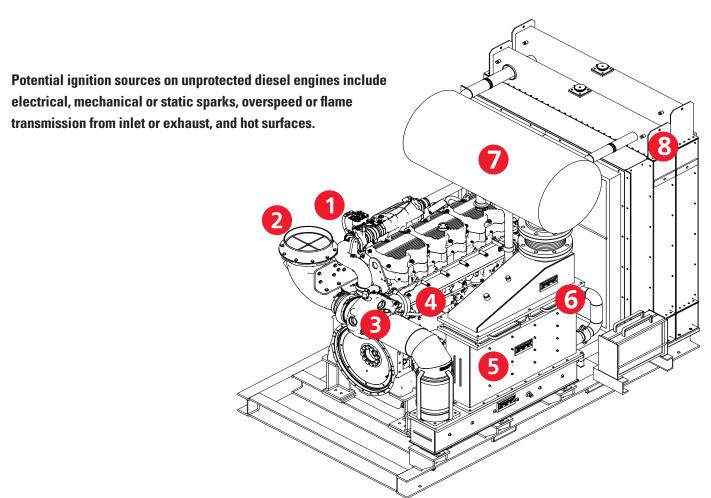






ENGINES IN HAZARDOUS AREAS - OVERVIEW





PYROBAN PROTECTION CRITICAL CONSIDERATIONS

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.

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).

Thermal control & treatment

Thermal signature of engines and ancillary parts can be further reduced using our proprietary thermal coatings











Exhaust Gas Heat Exchanger

Cools the engine exhaust below 200°C (T3) in local ambient.

6 Exhaust Flame Traps

Prevents back fire from the explosion proof exhaust system. Can be eliminated by using our certified $Ex-SCS^{TM}$ system or $Everclear^{TM}$.

Spark Arrestor

Ensures that no exhaust-born hot particles escape into the atmosphere.

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 ENGINE SAFETY KITS

FOR HAZARDOUS AREAS



KEY COMPONENTS OF PYROBAN KIT



Air inlet shut-off valve and air inlet flame arrestor



Water-cooled turbocharger and exhaust manifold



Exhaust gas heat exchanger



Thermal control and treatment



Standard exhaust flame arrestor, Ever Clear™ or Ex-SCS™ control system



Certified spark arrestor

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.

For the control system, we offer PCS 2[™] (see page 15) or Ex-SCS[™] (page 11).

HAZPAK RANGE

PACKAGED ENGINES FOR HAZARDOUS AREAS



Pyroban offers fully packaged Caterpillar, Cummins, JCB, Perkins, Deutz, John Deere, MTU and Scania engines.

Below are some examples of our recent HazPak models:

HazPak™ 100

<100 bhp

Pyroban C4.4 NA Pyroban C4.4TA HazGen

Perkins 1100



HazPak™ 200

101 - 200 bhp

Cat C7 Volvo D7 Cummins 6CTA 8.3



HazPak™ 350

201 - 350 bhp

Cat C9
Cummins



HazPak™ 500

351 - 500 bhp

Cat C15
Cat 3406DITA
DDC Series 60
Cummins QSM 11



HazPak™ 800

501 - 800 bhp

Cat C18
Cummins KTA 19



HazPak™ 1100

> 1100 bhp

Cat C32 MTU 12V 2000



When you specify a Pyroban Hazpak™ you're buying a pre-engineered and certified solution suitable for Zone 2 hazardous areas. Pyroban have conducted all necessary engineering, testing and final certification, including all Flame non-transmission testing and thermal testing in our Dyno facility.

We can produce standard packages that comply with EN1834-1:2000, but also have the flexibility to address problems using ATEX 2014/34/EU and EN1127 and complete customised packages for IECEx, NORSOK Z-15 and DNV 2.7-2 Applications. Fixed and Variable speed options are available. Depending on the specification of the donor engine. Donor engines can be free issued, or Pyroban can supply as part of the package.

We understand the offshore business and our packages are designed and executed to be robust and reliable in harsh operating conditions and corrosive environments.

For the control system, we offer PCS 2TM(see page 15) or Ex-SCSTM (page 11).

SOLUTIONS TO REMOVE EXHAUST FLAME ARRESTORS FROM YOUR OPERATION

There are two different ways to eliminate the "plate type" exhaust flame arrestor from the explosion proof diesel engine design. Operators can now get on with the job, enjoy longer operation and reduce unproductive downtime.

Furthermore, operators are no longer exposed to sources of ignition if a 'dummy arrestor' is used. Manual handling and environmental compliance issues also disappear by taking away the need to regularly change and solvent clean the heavy flame arrestors.

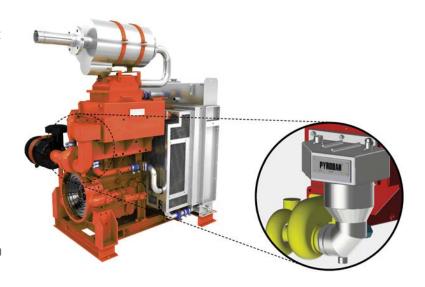
1. REPLACEMENT PART - EVERCLEAR™

A replacement part can be bolted into the exhaust system between the turbo and gas cooler, on the hot side of the exhaust flow.

The technology was launched in 2020 as a direct replacement for the "plate type" flame arrestors.

They are low in cost and can easily be fitted in the field to existing equipment. This means that the maintenance requirements every 8-12 hours are removed as soon as it is fitted.

Ever ClearTM Exhaust (ECE) Flame Arrestors developed by Pyroban are a direct replacement for the plate type flame arrestors found in Pyroban explosion protected diesel engines.



Costing as little as half the annual cleaning costs of a plate type exhaust flame arrestor, they are suitable for new, or existing, Pyroban protected turbo diesel engines (mechanical) above 100bhp. Tested in accordance with EN1834-1:2000 and suitable for T3, IIA & IIB gas groups.



2. ACTIVE CONTROL SYSTEMS - EX-SCS™

Pyroban's Ex-SCSTM takes an active approach to safety, combining flame arrestor elimination, safety shutdown and diesel engine control and monitoring into one flexible package for ATEX 2014/34/EU compliance.

Infrared gas detection is introduced into the engine inlet tract at a certified position and also within the equipment DNV 2.7-1 enclosure.

A safety shutdown is then triggered on detection of a flammable gas in the engine air inlet or in the atmosphere, diesel engine over speed, high exhaust gas and coolant temperatures, low oil pressure or if there is a manual emergency stop activation for example.

This active approach makes it easy to incorporate additional driven equipment controls such as pumps, generators, transmissions, or the well head platform's DCS (distributed control system).



A colour touchscreen HMI (Human Machine Interface) displays the current safety status and the diesel engine control and monitoring screens can also be integrated. For example equipment controls, pump sensors, as well as fire and smoke detectors can all be fed into Ex-SCS.



INTEGRATION EXAMPLES



C7 API 610 pump skid



Volvo D7 pump unit



C4.4 wireline unit with remote radiator for slimline fit



C9 package for pump unit featuring PCS 2



C15 Twin Cementor featuring ExSCS

INTEGRATION EXAMPLES



Cat C18 Air compressor



Perkins 1004 DGS



C15 Cementer



JCB Vaccum unit



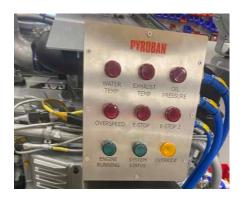
Volvo D7 HPU



Cummins QSM-11 N2 Unit

EX COMPONENTS

FOR HAZARDOUS AREAS



PCS2[™] control system

PCS 2[™] 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.



Airshut-off valves

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.



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.



Ex e Batteries

Category 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.



Ex Alternators

Category 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 Category 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.



Starter motor

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



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.



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 ISO9001:2008 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

