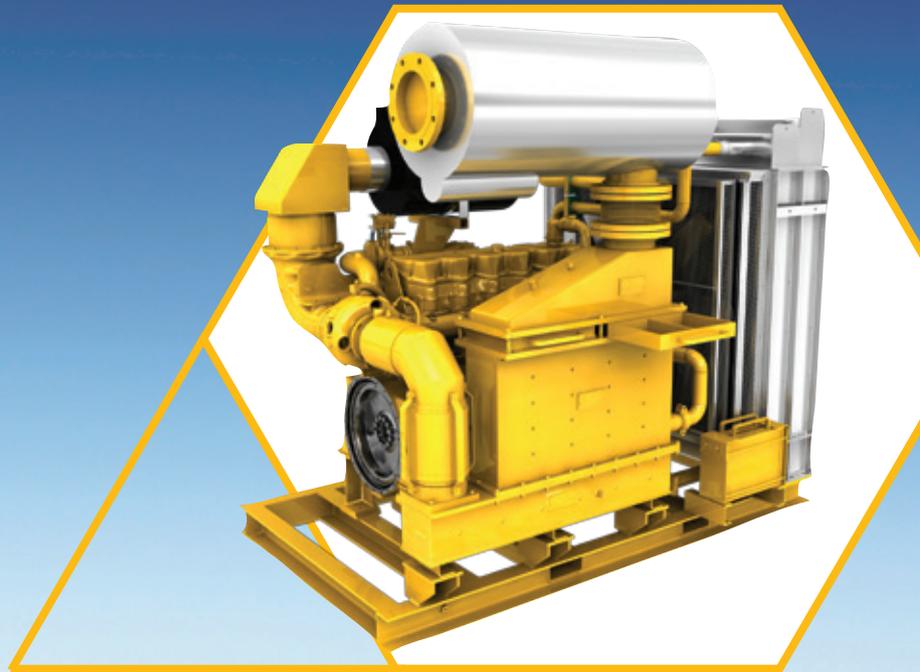
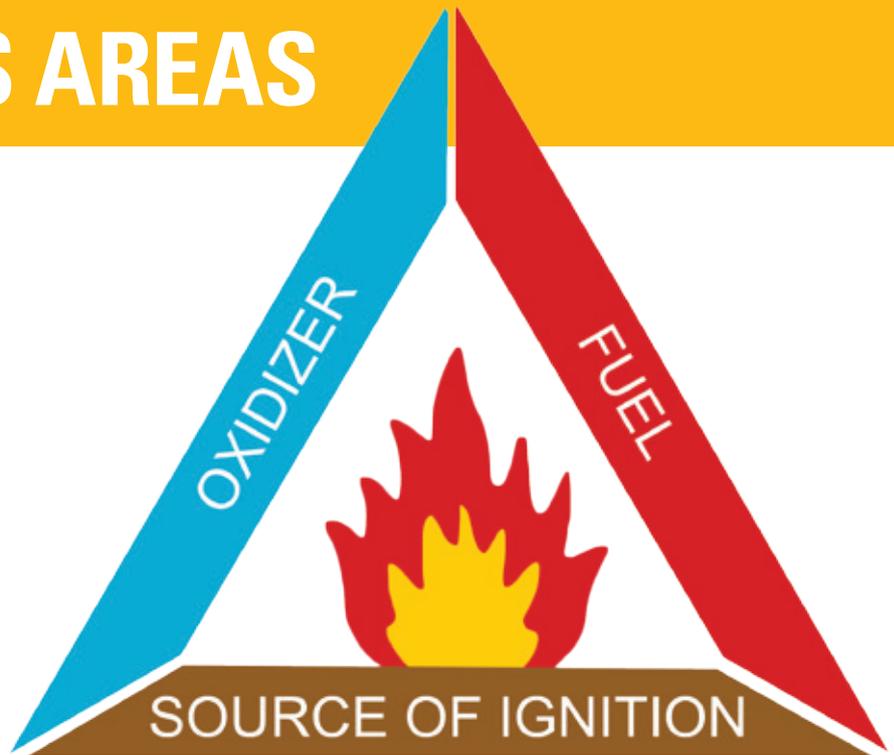


# EXPLOSION PROOF

Diesel Engines For Hazardous Areas



# HAZARDOUS AREAS



## Managing the Risk

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 can happen.

Cat HazPak solutions are designed to help keep these elements apart.

When the job takes you into a hazardous location, Cat® HazPak engines are ready.

Our complete range of services and engine packages cover both industry standards and your operation with maximum safety.

## The Science of Explosions

Safety is only effectively achieved through a holistic approach to explosion protection.

All factors must be considered in conjunction as illustrated here – it only takes one weak link to cause an explosion.



## Diesel Engines in Hazardous Areas

Potential ignition sources on unprotected diesel engines include electrical, mechanical, or static sparks, overspeed or flame from inlet or exhaust, and hot surfaces.

Flammable gases in the atmosphere can be sucked in through the air intake along with air for combustion. This can result in flashbacks through the inlet, backfires in the exhaust, or engine overspeed.

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.

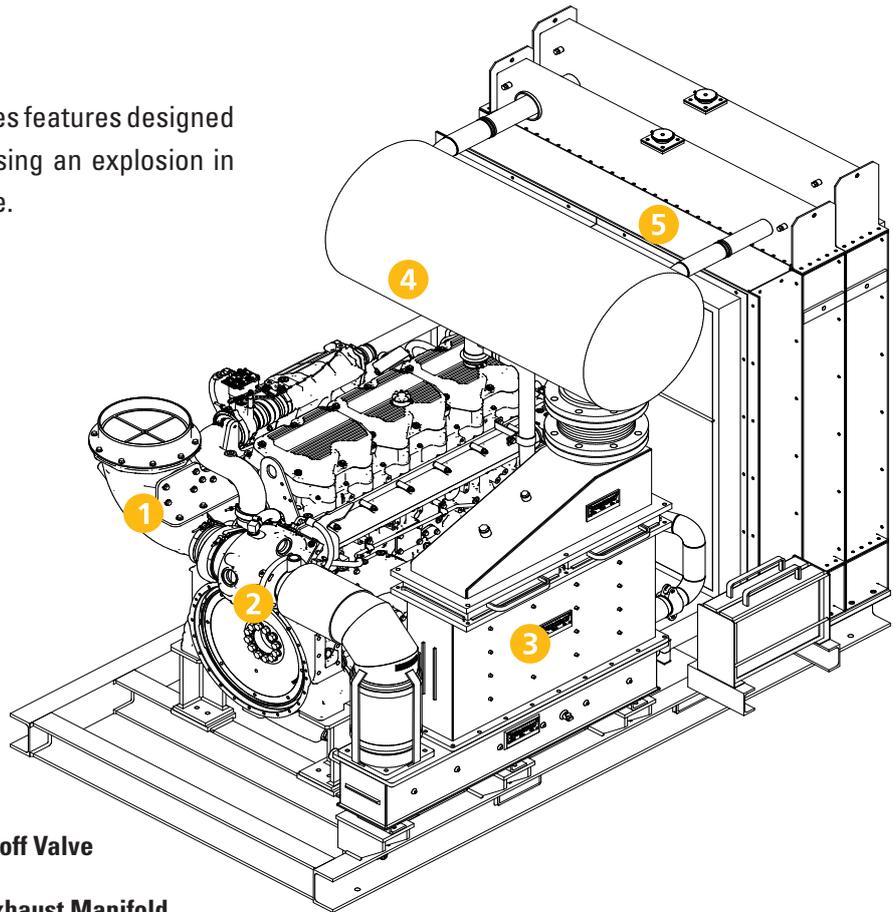
Another risk is engine misfiring, leading to an explosion further down the exhaust system, which could then ignite the surrounding atmosphere.

Various surfaces on a diesel engine can become hot and therefore sources of ignition. These surfaces need to be protected to avoid the danger of explosion.

**Cat explosion-protection technology was developed to guard against these and many other dangers.**

## Engine Design

A typical Cat HazPak engine includes features designed to prevent an ignition source causing an explosion in the event of a hydrocarbon release.



### KEY

- 1 Air Inlet Flame Arrester with Shut-off Valve**  
Provides shutdown on overspeed
- 2 Water-cooled Turbocharger and Exhaust Manifold**  
Ensures surface temperature is below 200°C (T3)
- 3 Exhaust Gas Heat Exchanger**  
Cools the engine exhaust below 200°C (T3)
- 4 Spark Arrestor**  
Ensures that no sparks or hot particles escape into the atmosphere
- 5 Radiator**  
The solder-dipped radiator core provides additional cooling capacity

### Explosion protection also includes:

- Battery and electrics
- Charge air pipe
- Automated shut-off system
- ECM

# EXPLOSION PROOF RANGE

## C2.2 NA

HazPak

### Fixed Speed:

19 kWm/25bhp @ 1500rpm

22 kWm /30bhp @ 1800rpm

### Variable Speed:

37 kWm/ 50bhp @ 2200rpm



## C4.4 NA

HazPak

### Fixed Speed:

39 kWm/52bhp @ 1500rpm

44 kWm/58bhp @ 1800 rpm

### Variable Speed:

64 kWm/86bhp @ 2200rpm



## C4.4 TA

HazPak

### Fixed Speed:

100 kWm/133bhp @ 1500rpm

112 kWm /151bhp @ 1800rpm

### Variable Speed:

97 kWm/130bhp @ 2200rpm

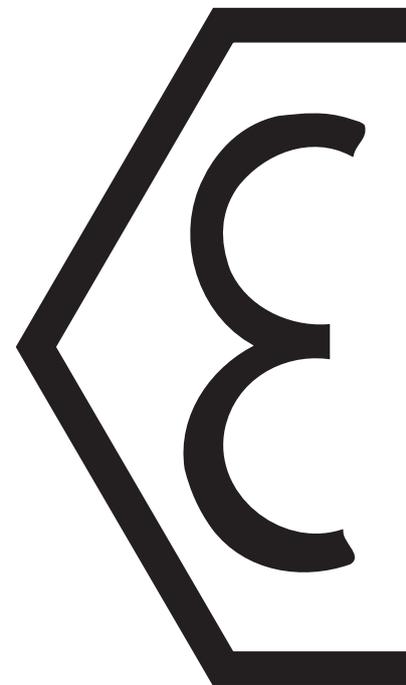


## C7

HazPak

172 kWm/230 bhp @ 2200rpm

205 kWm/275 bhp @ 2200rpm



All Cat HazPak products are certified, with some having tri-certification to ATEX 94/9/EC, IECEx and NEC 505/NEC 500.

## C32

HazPak

597 kWm/800 bhp @ 2100rpm

826 kWm/1110 bhp @ 2100rpm



**C9**

HazPak

254 bkW/340 bhp @ 2200rpm



**3406C**

HazPak

365 bkW/490 bhp @ 2100rpm



**C15**

HazPak

500 bkW/536 bhp @ 1800-2000rpm



**C18**

HazPak

533bkW/715bhp @ 2100rpm



The engine images are indicative of a standard engine package, with a standard spark arrester. Options are available on these packages, please contact your Cat representative for more information.

# POWER AND COMPLIANCE



## Certification and Testing

All Cat HazPak engines are certified, with some having tri-certification to ATEX 94/9/EC, IECEx, and NEC 505/NEC 500.

With in-house test facility procedures and approval to national standards, Caterpillar ensures quality at every step in the process

## Quality

Additional to ISO9001:2008 quality standard certification, Caterpillar has the required level of third party certification for ATEX, IECEx, and NEC.



Cat HazPak engines are designed, tested, and certified to support the certification of your completed equipment. All products are supported in the field by specialist engineers.

## Engineering Excellence

With more than 40 years of experience delivering complex hazardous area engineering solutions, Caterpillar delivers high quality safety products worldwide.



## Manufacturing Security

Cat HazPak engines are designed, manufactured, and tested by Caterpillar, in Caterpillar factories for single-source package confidence.





## Legal Compliance

Regional legislation governs health and safety issues related to explosion protection of electrical equipment worldwide.

However, since mechanical equipment is not always regulated, there is a significant potential risk to people, the environment, and your investment. Be aware of the risks and choose additional discretionary safety.

## Electrical Equipment

Europe	USA	Rest of World
ATEX 94/9/EC	NEC	IECEX

## Mechanical Equipment

Europe	USA	Rest of World
ATEX 94/9/EC	-	Regional specific

## Global Support

Cat Zone 2 hazardous location solutions are fully supported by the Cat worldwide dealer network.

More than 100,000 trained technicians and global parts distribution ensure that the parts and support you need are never out of reach.

Engineers can be quickly mobilized offshore with all the necessary medical certificates and survival training, anywhere in the world 24/7/365.





## Stay Confident

Complete package or retrofit, when you invest in legendary equipment, you get legendary support. Caterpillar remains your partner through changing technology in a changing industry. And the Cat dealer network is where you are, when you need them, year after year. Cat parts, maintenance, repair, and experience are at your service for the life of your engine.

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call your local Cat dealer or visit [www.catoilandgasinfo.com](http://www.catoilandgasinfo.com).**