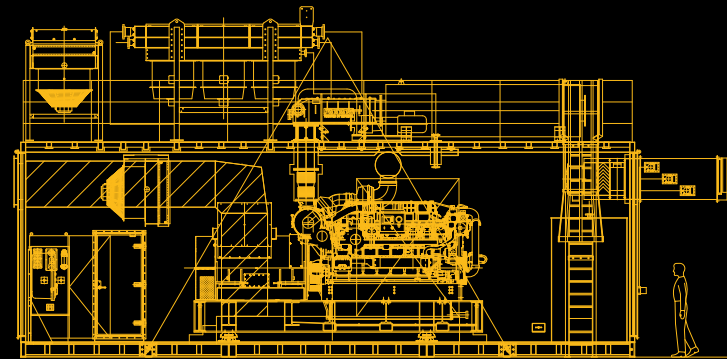




**OIL & GAS
POWER SOLUTIONS**

Finning
TRUSTED BY EXPERTS.

FINNING **CAT**



EXPERTISE YOU CAN TRUST

Finning Power Systems is part of Finning International Inc., the world's largest distributor of Caterpillar® plant, engines and power solutions.

Our success has been built on the overriding belief that "To be the best you have to deliver the best."

Delivering on this promise requires; the ability to provide solutions for the most challenging applications, on land and offshore, an intuitive understanding built on years of experience in the field and a total, all encompassing commitment to delivering lasting reliability.

These are the qualities that have made Finning a world leader in the supply of power system solutions for the oil and gas industry.

POWER YOU CAN BELIEVE IN

Visit any oil or gas installation from the frozen wastes of the Arctic to the searing hot deserts of the Middle East or the treacherous waters of the North Sea and the critical role played by Cat engines soon becomes clear.

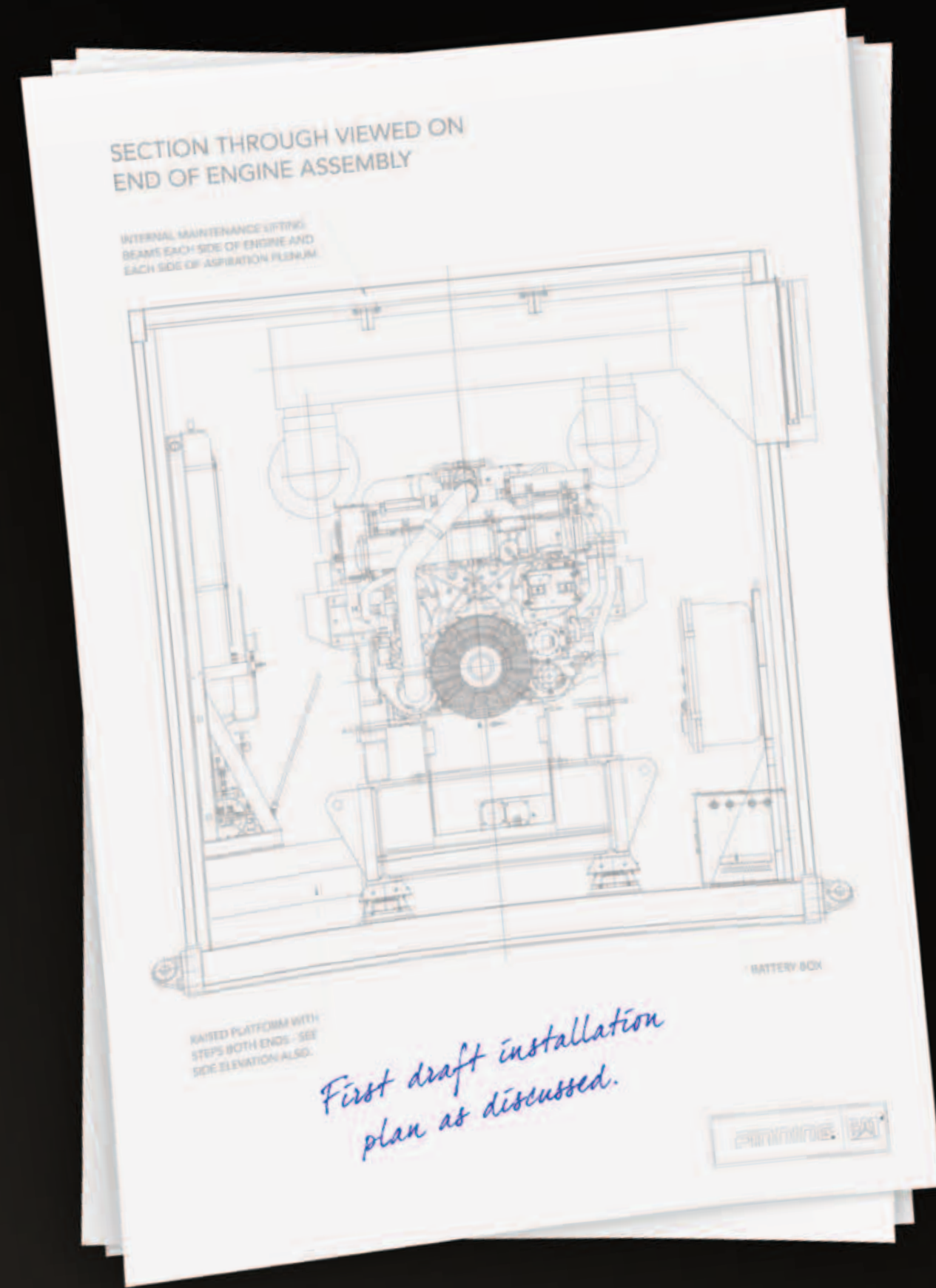
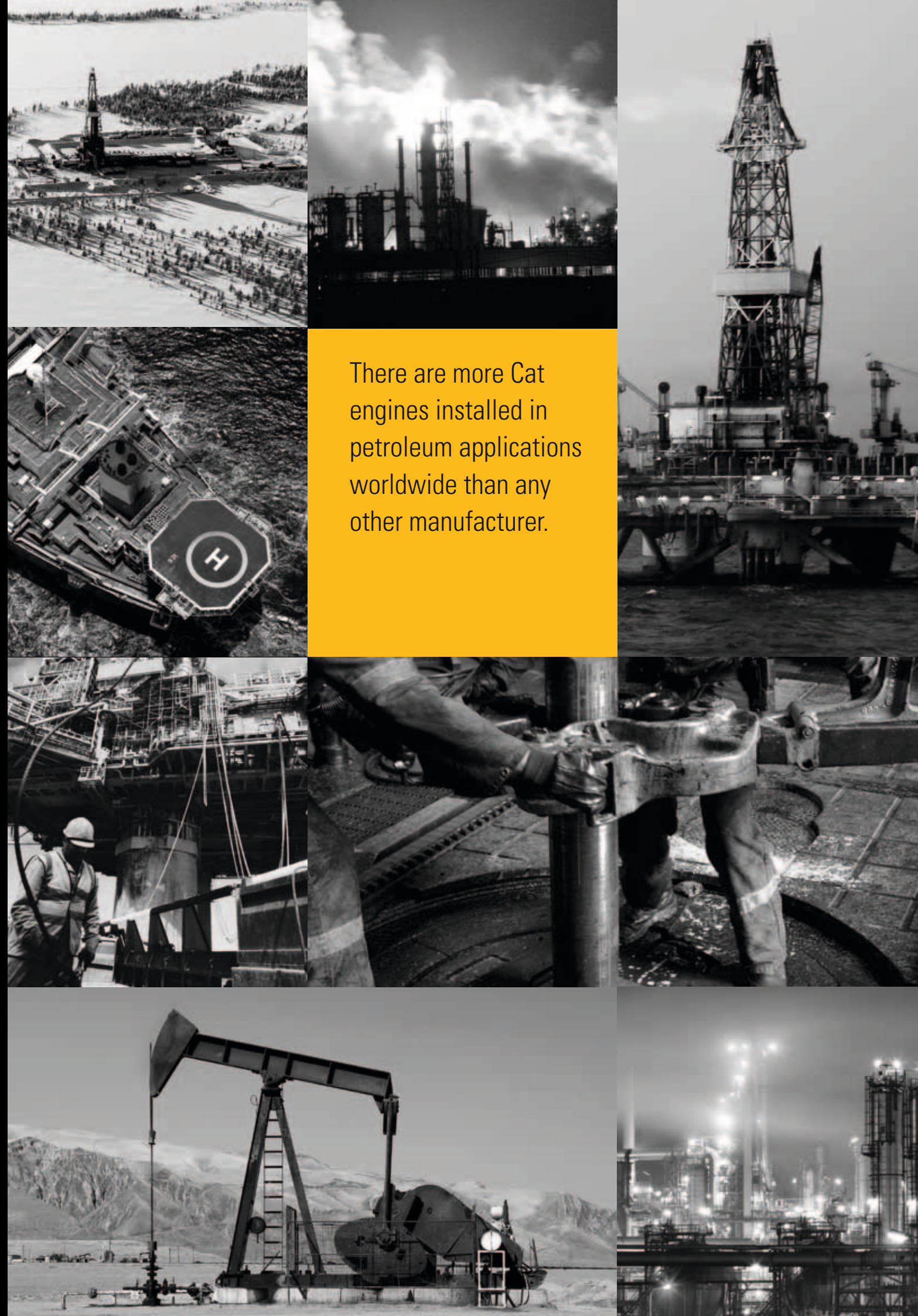
Bespoke power system solutions engineered by Finning are used in every conceivable application, upstream and downstream.

- Offshore and land drilling
- Well servicing: high pressure pumping, coil tubing and nitrogen power
- Offshore prime and emergency power for fixed and floating facilities
- Mechanical power for offshore cranes
- ATEX and Zone 2 power solutions
- Production pipeline pumping and power generation
- Fire pump engine power

There are more Cat engines installed in petroleum applications worldwide than any other manufacturer.

COMMITMENT

Our success has been built on the overriding belief that "To be the best you have to deliver the best."



Every oil & gas engine we supply is designed around proven technology, custom built to meet the exact requirements of each individual application.

ANY APPLICATION. ANY WEATHER. ANY ALTITUDE. ANY EVENTUALITY. ANYWHERE.

Designed to perform and keep on performing, even in the most diverse of conditions, the solutions we supply are based on equipment that has been tried, tested and proven in major oil and gas installations around the world.

Finning's expertise has been proven on oil & gas installations across the globe.



SPP PUMPS NORTH SEA

Design and installation of two Cat 3512C HD engines to drive firewater pumps on a new Octabuoy semi-submersible drilling, production and storage facility.

- Engines rated 1678 kW at 1800 rpm custom packaged to meet the requirements of NFPA 20 (National Fire Protection Association)
- Capable of full power at a constant 22.5-degree tilt in the event of an emergency
- Certified to EPA marine tier two classification and engineered to meet the E3 emissions' test cycle for marine applications

KENZ FIGEE NORTH SEA

Cat C18 twin turbo engine, custom engineered to power lifting gear in variable offshore conditions.

- Designed to operate in specified ambient conditions, whilst providing a smaller overall footprint
- New engine rating, 651 bkW (872 hp) at 22200 rpm, developed and engineered exclusively for this application
- Specially modified to enable remote radiator cooling, creating a much smaller and lightweight package



CLYDEUNION PUMPS, AN SPX BRAND IRAQ

Bespoke engineered package to provide mechanical power for specialist firewater pumping equipment.

- Complete package built around two Cat 3412 diesel engines including support base, controls, exhaust, and fuel system
- Installed in a weatherproof enclosure purpose-designed for desert conditions
- Custom engineered radiator cooling system designed to deal with high ambient temperatures
- Designed and built in compliance with the NFPA 20 (National Fire Protection Association) standards

LEADING EPC MALAYSIA

Design, manufacture and commissioning of custom engineered, hazardous area generator for a submersible fire pump and motor on a floating production, storage and offloading FPSO (Floating, Production, Storage and Offloading).

- Cat 3512B engine, engineered to comply with DNV Marine Classification and the SOLAS safety standards
- Installed in pressurised H60 container for use in a Zone 2, temperature class T3 (below 200°C), Gas group IIA hazardous area
- Start and stop fail-safe mechanisms in accordance with the NFPA20





Our people work closely with owners and builders to ensure each engine-driven package meets the specification and site requirements of the application.

CUSTOM BUILT TO PERFORM, AND KEEP ON PERFORMING

Working with many of the world's largest engineering oil and gas contractors, the Finning Oil and Gas team has the knowledge and experience to provide a full service, from design concept and FEED (Front End Engineering Design), to detailed engineering with capabilities for power sizing, specification review, project management, assembly, testing and commissioning. Each custom package is rigorously tested before it reaches site to keep commissioning time to a minimum.

Our people work closely with owners and builders to ensure each engine-driven package meets the specification and site requirements of the application.

Finning has the tools and expertise to evaluate and size the engine and generator against load demands, taking into consideration ambient temperatures, altitude and fuels available ensuring we deliver the best possible performance.

Whatever you need, wherever you are, you can rely on us to create a solution that delivers against your exact requirements.

EXPERTISE

Finning provides a complete service from design concept and FEED, to detailed engineering, project management, assembly, testing and commissioning.

SAVING FUEL AND REDUCING OPERATING COSTS

Finning can supply a complete range of gaseous and liquid fuel powered engines and power solutions to meet any application. Gas engines burn natural gas, propane, coal seam gas and other gaseous fuels. Diesel engines can be engineered to operate on crude or residual oils, as well as diesel fuel from around the world.

ENGINE RATINGS

For standard production applications we use the best-in-class tool, EP (Electric Power) Specsizer. This tool enables us to determine the optimum size of generator sets to meet customer requirements, based on the client's motor load list. For custom applications we can offer an oversize alternator.

Another tool, GERP (Gas, Engine, Rating, Programme) allows us to input the site gas composition and determine the methane number, enabling us to select the precise engine and compression ration for each individual application.

DYNAMIC GAS BLENDING

With global demands to reduce gas flaring increasing, Cat has developed its own, unique Dynamic Gas Blending technology for drilling and production engines.

For example, this enables existing 3500 series diesel engines to run on up to 70% gas and has the capability to adapt to incoming fuel quality and pressure. Therefore our engines can run on a wide variety of fuels, from associated gas to gasified LNG.

AVAILABLE FOR RETROFIT

If you retrofit your existing equipment, you will get all the benefits of Dynamic Gas Blending plus the advantages of a complete package, including full warranty coverage and genuine parts from the global Cat dealer network.

- Bolt-on component installation
- Consolidated parts packaging
- Ease of order with one part number for the kit

FEATURES AND BENEFITS

- Reduces gas flaring minimising environmental impact
- Continuously modulates gas substitution under all transient loading, optimising fuel savings
- Accepts up to 55% inerts
- Requires no recalibration when equipment is moved or gas supply changes
- Lowers fuel costs with up to 70% of diesel being replaced by gas
- Maintains existing service intervals and prolongs component life
- ADEM™ A4 and EMCP 4.4 controls increase display and diagnostic performance

INNOVATION

Dynamic Gas Blending technology enables existing diesel engines to run on 70% gas, saving fuel, reducing emissions and lowering operating costs.



DYNAMIC GAS BLENDING TECHNOLOGY ENABLES DIESEL ENGINES TO RUN ON UP TO 70% GAS, WHICH NOT ONLY SAVES FUEL, BUT ALSO SIGNIFICANTLY REDUCES GAS FLARING.

TAKING THE RISK OUT OF HAZARDOUS AREAS

Offshore fixed and floating platforms, FPSO's, downstream refineries, LNG terminals, wherever there is oil or gas there is a potential hazard.

If flammable hydrocarbon gases are released into the atmosphere and come into contact with an ignition source there is a real risk of a major explosion.

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

Flammable gases can be sucked in through the air intake, along with air for combustion, leading to flashbacks through the inlet or backfires in the exhaust.

If the engine consumes flammable gas mixed with air and diesel fuel there is a danger of overspeed, which can lead to the engine running out of control and ultimately result in a catastrophic failure.

Even if flammable gases don't enter the engine itself there is still a danger of ignition from contact with hot surfaces on the outside of the engine.

Finning is a leading supplier of engines for pipeline pumping and firewater pump protection, configured and packaged to operate in Zone 2, T3, Gas Group IIA hazardous areas, where there is a risk of explosive atmospheres.

We have considerable experience built up over more than 30 years in creating bespoke solutions to meet the most stringent quality and safety standards including:

- Class I Division 2 Groups C & D for Gas engines
- Class I Zone 2
- ATEX Zone 2, Category 3G Group IIA, T3
- EN 1834-1, ASTM F2876 & NEC500/505
- EN60079 Pressurised Solutions

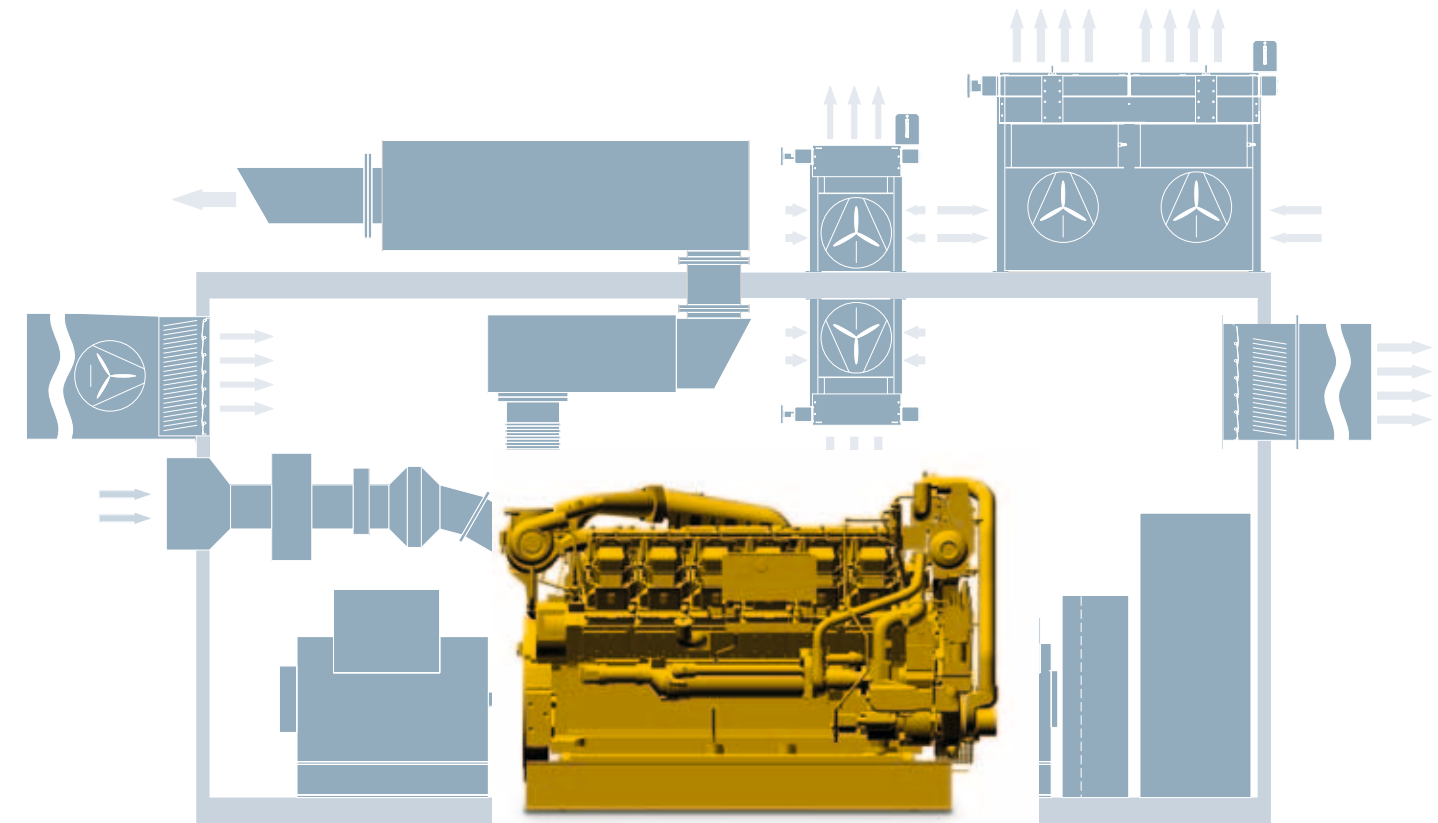
Every package we create is custom engineered to suit the appropriate regional, national and international health and safety legislation, specific site conditions and the individual operation and maintenance requirements of each client.

Our expertise includes the design and configuration of Exd rated equipment, non-sparking components, exhaust gas coolers, flame arrestors, gas sensing and controls.

PROVEN

Finning's hazardous area solutions are built around proven technology including the latest generation of Cat HazPak's, certified to ATEX 94/9/EC, IECEx, and NEC 505/NEC 500.

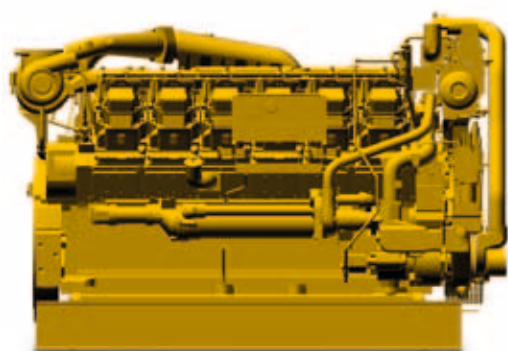
PRESSURED ENGINE SOLUTION



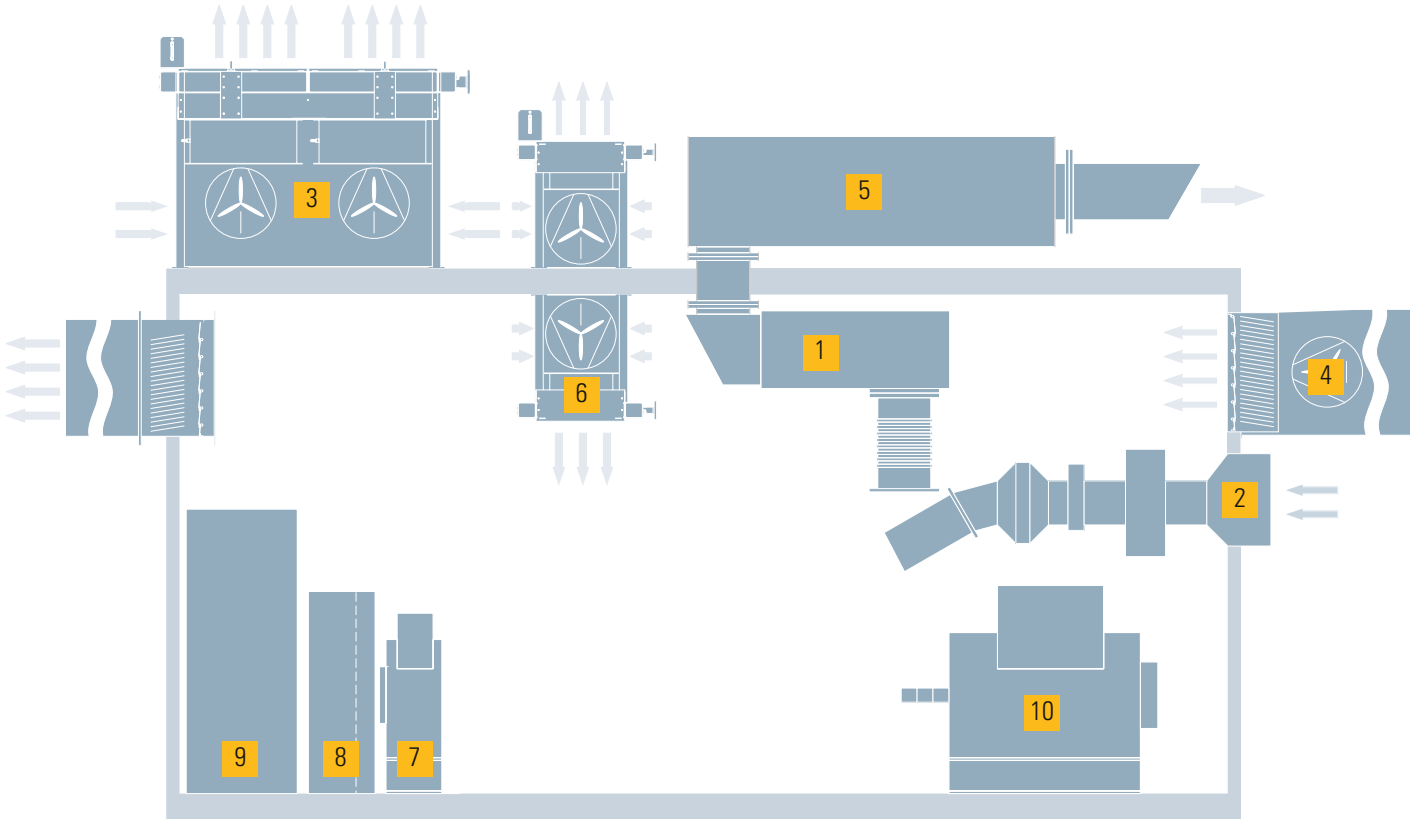
FACT

Finning has delivered over 1,000 engine and generator solutions to the oil and gas industry in the last 30 years.

EVERY WORLD CLASS SOLUTION STARTS WITH A WORLD CLASS ENGINE



EVERY WORLD CLASS ENGINE NEEDS A WORLD CLASS SOLUTION



1

Water-cooled Turbocharger and Exhaust Manifold

Ensures surface
temperature is
below 200°C (T3)

2

External Combustion Air Inlet

With intake flame
arrestor and air inlet
shut off

3

Air Blast Radiator

Marine grade for
engine jacket and
after-cooler and
exhaust gas

4

Exhaust Gas Heat Exchanger

Cools the engine
exhaust below
200°C (T3)

5

Exhaust Spark Arrestor Silencer

Ensures that
no sparks or hot
particles escape
into the atmosphere

6

Room Cooling

Is available for
applications if
required

7

Aux Alternator

Provides power
for the HVAC
and radiator

8

Exd Motor Control Centre (MCC)

Termination
enclosure with the
ability to sequence
and cascade start all
package motors

9

Custom Control Panel (UCP)

Ensures surface
temperature is
below 200°C (T3)

10

AC Alternator

Provides power for
the intended
application - Prime /
Standby / Auxiliary

Explosion protection also includes:

- Starting system(s)
- Automated shut-off system
- ECM

SETTING NEW STANDARDS FOR EMISSIONS ACROSS THE GLOBE

Oil and gas applications around the world are required to meet local and international emission regulations which require different products for offshore and land based applications, with the additional requirements to operate in hazardous areas. Finning’s bespoke solutions are engineered to meet, and in many cases, exceed all of these requirements.

KNOWLEDGE

With over 30 years of experience in creating bespoke solutions for the oil and gas industry, Finning is a leading authority on international emission standards and compliance.



Global Emissions Level Tiers

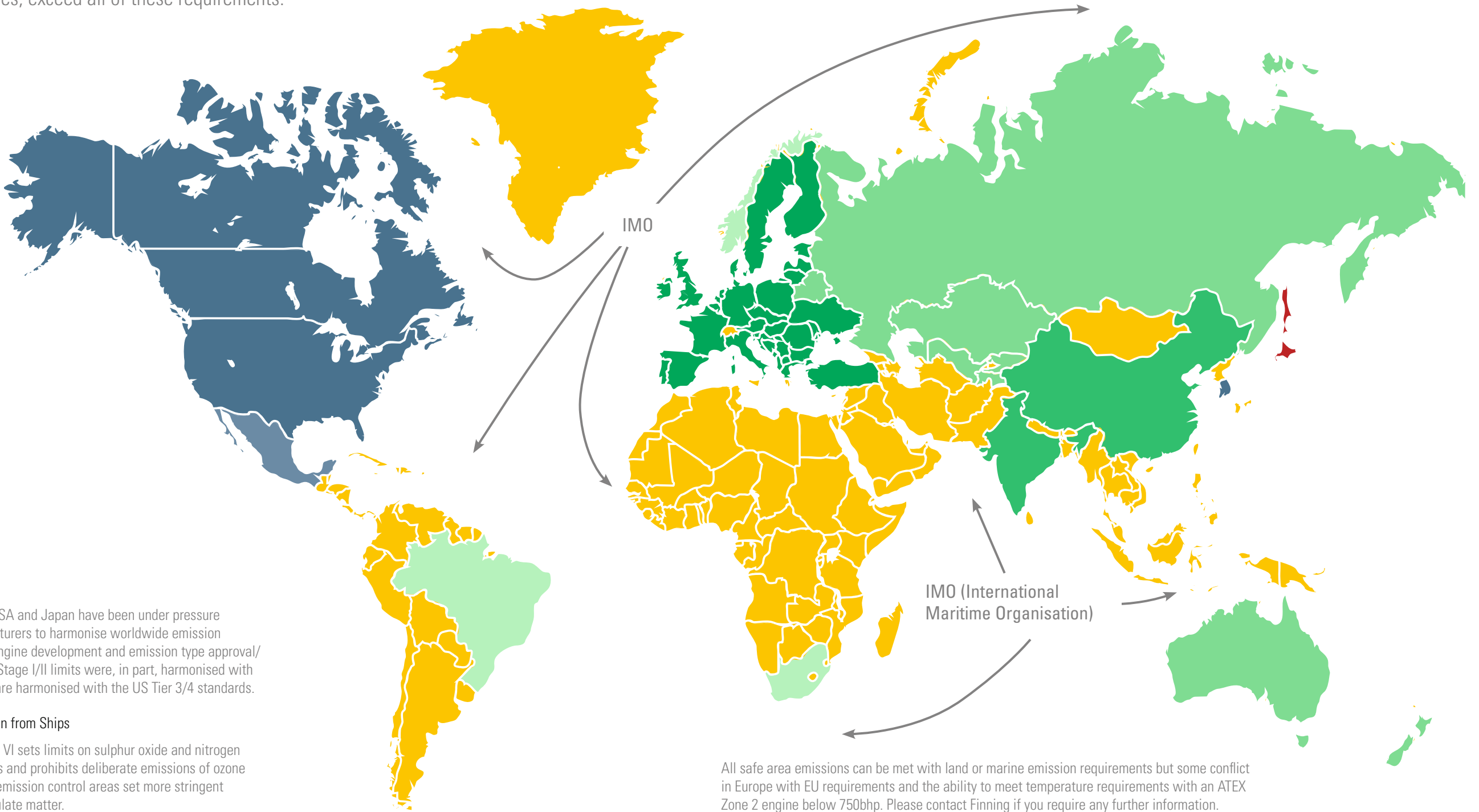
EPA	EU	JAPAN
T4	IV	J4
T4i	IIIa	J3
T3	IIIb	J2
T2	II	J1
T1	I	

GLOBAL EMISSIONS REGULATIONS 2016

Regulatory authorities in the EU, USA and Japan have been under pressure for engine and equipment manufacturers to harmonise worldwide emission standards, in order to streamline engine development and emission type approval/certification for different markets. Stage I/II limits were, in part, harmonised with US regulations. Stage III/IV limits are harmonised with the US Tier 3/4 standards.

Annex VI Prevention of Air Pollution from Ships

IMO identified as MARPOL Annexe VI sets limits on sulphur oxide and nitrogen oxide emissions from ship exhausts and prohibits deliberate emissions of ozone depleting substances; designated emission control areas set more stringent standards for SOx, NOx and particulate matter.



All safe area emissions can be met with land or marine emission requirements but some conflict in Europe with EU requirements and the ability to meet temperature requirements with an ATEX Zone 2 engine below 750bhp. Please contact Finning if you require any further information.

ONE RANGE

Finning offers the broadest range of solutions in the industry, for every conceivable application from drilling, gas compression and production to pumping and well servicing.



C SERIES - HAZARDOUS LOCATION

OIL & GAS PRODUCT RANGE



C SERIES
HAZARDOUS LOCATIONS



G3300B



C SERIES
OIL FIELD GENERATOR SETS



C SERIES
TIER 4



CG137



PETROLEUM TRANSMISSIONS



3500 WELL SERVICE



G3500



G3600



C175



C280



GCM34



C280

DRILLING
PRODUCTS

C15 ACERT™	3512C	TH35-E81 Transmission
C18 ACERT™	3516	CX31-P600 Transmission
C27 ACERT™	3516B	CX35-P800 Transmission
C32 ACERT™	356C HD	TH48-E70 Transmission
3508	C175-16	
3508B	C280	
3508C	CM	
3512	TH31-E61 Transmission	
3512B		
3512C		

GAS COMPRESSION
PRODUCTS

G3304	G3412C	G3606
G3304B	G3508	G3608
G3306	G3508B	G3612
G3306B	G3512	G3616
G3406	G3512B	GCM34
G3408	G3516	CG137-12
G3408C	G3516B	
G3412	G3520B	

PRODUCTION
PRODUCTS

C15 ACERT™	G3406	C280
C18 ACERT™	G3412	3400/3500 Generator Sets
C27 ACERT™	G3412C LE	3600
C32 ACERT™	CG137-12	CM
	G3508	Fire Pump
	G3512	
	G3516	
	G3516B	
	G3516C	
	C175-16	

WELL SERVICE
PRODUCTS

C2.2	C18 ACERT™	CX31-P600 Transmission
C4.4 • C4.4 ACERT™	C27 ACERT™	CX31-P600 Transmission with Integral Drop Box
CB.6 ACERT™	C32 ACERT™	CX35-P800 Transmission
C7 ACERT • C7.1 ACERT™	3512B	TH48-E70 Transmission
C9 ACERT • C9.3 ACERT™	3512C HD	TH48-E80 Transmission
C11 ACERT™	Hazardous Location	CX48-P2300 Transmission
C13 ACERT™	Water Cooled Manifold	TH55-E70 Transmission
C15 ACERT™	TH31-E61 Transmission	TH55-E90 Transmission

A TOTALLY INTEGRATED SOLUTION

A total turnkey-solution, Finning's bespoke Offshore Power Generation models offer unrivalled flexibility to tailor the power solution to meet any platform site requirements.

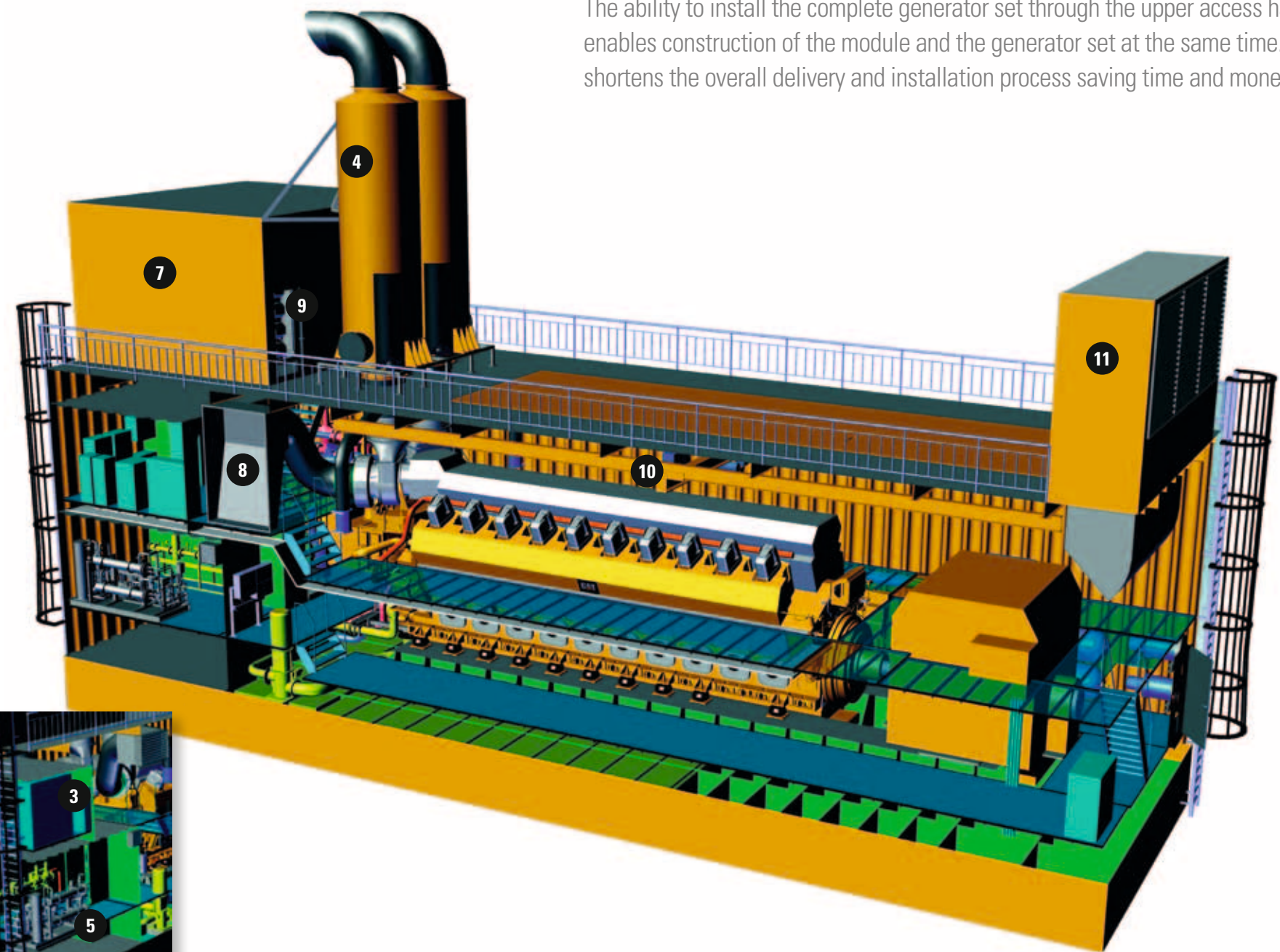
Whatever the situation, it meets the most stringent offshore environmental and safety quality standards. Select your power and fuel options and we do the rest. The module can be designed to run on liquid fuel, diesel oil, crude oil, heavy fuel oil (dependent on engine size), gas or in bi-fuel mode.

A product with years of experience in the offshore industry, this unique model combines and optimises efficiency and reliability with environmental performance.

Remote monitoring means that it may be easily operated from the main control room or locally. Our offshore oil and gas team works closely with the your designers to ensure all interface and connection points are easily accessible.

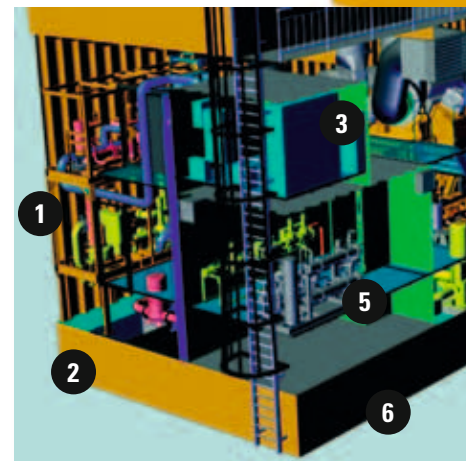
BUILT AROUND YOU

The power module can be easily assembled on site at a shipyard or fabricators yard. The ability to install the complete generator set through the upper access hatch enables construction of the module and the generator set at the same time. This shortens the overall delivery and installation process saving time and money.



KEY

1. Lube Oil / Cooling Water Module
2. MDO Tank
3. Electrical Equipment Room
4. Exhaust Silencers
5. Fuel Feeder/Booster Module
6. Crude Oil Tank
7. Ventilation Out
8. Combustion Air Inlet
9. Water Mist Fire Extinguishing System
10. Service Crane
11. Ventilation In



WHY FINNING?

WORLDWIDE CAPABILITY

Finning's oil and gas expertise has been proven across the globe from frozen wastes of the Arctic and the treacherous waters of the North Sea, to the heat drenched deserts of the Middle East.

FINANCIAL STABILITY

Finning (UK) Ltd is the UK division of Finning International Inc. one of the world's largest distributors of Caterpillar plant, complementary equipment and power systems. Headquartered in Vancouver, Canada, and listed on the Toronto Stock Exchange, Finning has bases in the UK and Ireland.

EXEMPLARY SAFETY RECORD

One of the essential values that Finning holds is that all accidents, incidents and ill health are preventable. For our part the main objective we have committed to is ensuring the personal health, safety and welfare of all exposed to risk associated with our solutions. As winner of RoSPA Sir George Earle Trophy, Finning is world renowned for ensuring the safest working conditions in the diverse range of industries in which we work.

WORLD CLASS PRODUCTS

Designed to perform and keep on performing, even in the most diverse of conditions, the solutions we supply are based on equipment that has been tried, tested and proven in major oil and gas installations around the world.

OVER 30 YEARS EXPERIENCE

We have been supplying the oil and gas industry with custom engineered solutions for every conceivable upstream and downstream application for more than three decades.

INDUSTRY LEADING EXPERTISE

Our knowledge extends across all aspects of the industry from offshore and land drilling, well servicing and production pipeline pumping, to prime and emergency power, mechanical power for lifting gear and power pumps, and ATEX and Zone 2 solutions.

ENVIRONMENTAL PERFORMANCE

We are committed to ensuring that the principles of sustainable procurement are applied to our suppliers who are vetted for their environmental performance. This is part of our continuous improvement strategy to deal with the challenges of climate change and is a key requirement of our ISO 14001 environmental certification.

Finning (UK) Ltd

Orbital 5A
Orbital Way
Cannock, Staffs
WS11 8XW

Tel: +44 (0) 1543 465 165
Email: psmail@finning.co.uk
www.finning.co.uk



TRUSTED BY EXPERTS.