

# FAIRREPORT

A special edition of DEUTZ LIVE magazine



## TECHNOLOGY

Hybrid drive – performance  
as a double act

## EXPERTISE

Legislation separates  
wheat from chaff

## SERVICE

Double the  
protection

## Interactive pdf edition

Even easier to navigate – hyperlinks from categories, headlines  
and pictures on the contents pages get you directly to the  
article. To get back to the contents you either click on the  
category or simply on the page number.

**Tough engines  
for tough  
machines**

**MACHINERY +++ MOBILE MACHINERY +++ MOBILE MACHINERY**



Gordon Riske,  
Chairman of the  
Management Board  
of DEUTZ AG

# Engines of the future

Dear readers, our skills, our independence and our flexible structures make DEUTZ an ideal partner for manufacturers of construction machinery and underground equipment. DEUTZ's range of expertise includes state-of-the-art engines, skilled fitting advice and global service. Working together with you, our drive solutions are always to the point, and we identify the ideal solution for each application. And you can depend on one thing in particular – DEUTZ will offer the right drive option for you at the right time.

In terms of robustness, compact installation dimensions and economy, there is no real alternative to the combustion engine at the moment – hydrogen engine and fuel cell technology are still well short

of being ready for serial production. In contrast, the hybrid drive is already a drive option of potential interest. So, working with the Weyhausen company, we have developed a prototype of a wheel-loader with a hybrid drive which shows that DEUTZ should always be your first choice when the very heart of your machine is concerned.

DEUTZ has been firmly established in the world of mobile machinery for decades. Day in, day out, we are working very hard to maintain this reputation and to continually improve our engines and make them ever more environmentally friendly. And you can rely on that!

Yours

Gordon Riske

## INNOVATION

- 4 Tough engines for tough machines**  
Premium manufacturers from all over the world trust in DEUTZ's modern engine technology

## TECHNOLOGY

- 8 Future option for construction sector**  
The new 2010 series handles the tough conditions in which construction machinery operate

- 9 Bestseller also with water cooling**  
Now also available with water cooling – the engine series 2011

- 10 Performance as a double act**  
Together with Atlas Weyhausen DEUTZ develops a hybrid drive for mobile machinery

## EXPERTISE

- 11 Talented loader**  
The telescopic loaders from Kramer convince with power, speed and versatility

- 12 Breaking through**  
In response to the rapid growth of passenger and goods transport, most EU countries are turning to tunnel construction

- 13 Emission legislation separates the wheat from the chaff**  
Emission standards are becoming more and more demanding and determine the development work of engine manufacturers

## SERVICE

- 14 Quality makes the difference**  
Mobile machinery claim a lot from modern engines and the applied lubricants
- 15 Double the protection**  
With a new part number label, buyers of original spare parts can verify that the goods are genuine DEUTZ



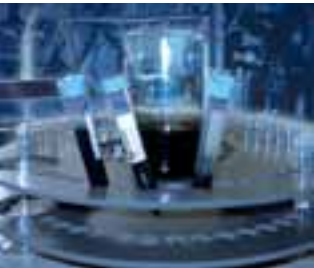
**4** Powerful and economical: Many renowned manufacturers of mobile machinery count on modern engine technology from DEUTZ



**11** Versatile: Telescopic loaders with an extendable lifting arm



**12** Gigantic tunnelling projects make for global attention. DEUTZ engines are there when the breakthrough happens



**14** Subjects such as oil and filtration accompany engine manufacturer and customer throughout the engine's entire working life



# Tough engines for tough construction machines

Premium manufacturers from all over the world trust in DEUTZ's modern engine technology. And at bauma 2007, they introduced their new products to a broad public

It has long been the case that it is not just industrialised countries who invest in maintaining and improving their infrastructure. And construction machinery manufacturers are catering for this worldwide development – with an extensive range of machinery and equipment for deployment on construction sites and underground. The heart of these machines continues to be the drive engine. Crucial for manufacturers and operators is not only the engines' power and reliability, but increasingly also the extent to which they can be depended upon to conform to current and future emissions limits.

## Vögele: New road pavers in the compact class

Despite their slim silhouette, the new road pavers from Mannheim-based Vögele can hold ten tons of mixed material. Due largely to the fact that they are just five metres long, the Super 1100-2 and Super 1300-2 machines are suitable for use in narrow urban streets, crooked squares and steep country roads. Under the bonnet of the Super 1100-2, an electronically controlled 4-cylinder 2011 series engine outputs 56 kW at 2,300 min<sup>-1</sup> while in the Super 1300-2 a variant with charge-air cooling is used that outputs 65 kW at 2,300 min<sup>-1</sup>. The new Vögele machines are avail-



able as crawler pavers under the names Super 1100-2 and Super 1300-2. The wheeled paver versions are called Super 1103-2 and Super 1303-2.

## Bomag's compactor inspires superlatives

Bomag GmbH could pull off a real surprise coup with their new BW 236 DI-4. It is, incredibly, the heaviest and most powerful compactor ever built. Driven by a 6-cylinder, TCD 2013 series engine with a 2-valve system outputting 200 kW at 2,300 min<sup>-1</sup>, this power pack, fitted with a polygon drum, is designed specifically to compact layers of bulk material up to three metres thick to create earthworks and embankments, and to do the post-compaction of existing grounds up to 4.5 metres deep. Compared with the previous largest compactor, also built by the world's leading compaction technology company, the capacity of the 36-ton vehicle speaks for itself. With an approximately 50 percent increase in compaction amplitude, the machine is extremely efficient to use, particularly in large projects such as the development of the artificial "Palm Islands" in Dubai – and for building new airports and similarly ambitious development projects.



## Wirtgen guarantees best milling results

Somewhat smaller, but no less effective, Wirtgen GmbH also opts for DEUTZ's drive technology. Wirtgen, who manufacture mobile machinery for road construction, presented two new, small-capacity milling machines based on the proven technology of the 6-cylinder variant of the TCD 2012 2V. Both the W60 road milling machine for digging trenches and channels and, particularly, the innovative, powerful W 100 rear loader caused a sensation. With a milling width of one metre and a 30 cm milling depth, this is the high-end machine in this rear loader class of Wirtgen's generation of small milling machines. The W 100 achieves true top performance in large-scale areas, by providing the ideal base both for renovating paving and for completely removing paving layers. Its permanent 4-wheel drive ensures the 4-wheel machine has even traction. Moreover, with its 155 kW at 2,300 min<sup>-1</sup>, the DEUTZ engine provides superior daily outputs and the very best milling results. The engine, of course, also complies with stage 3 emission standards.



## Ditch Witch with new riding plough

Ditch Witch, an established company based in the US state of Oklahoma and originally specialising in

trench milling machines, has long enjoyed a fine reputation wherever there is a demand for laying cables or lines of any kind. With its new 420SX vibratory plough, the manufacturer combines the benefits of its extremely versatile vibratory cable-laying plough with the power of larger models for earth laying. At the heart of this compact machine, a 3-cylinder DEUTZ 2011 series engine with 31 kW at 2,300 min<sup>-1</sup> not only offers increased driving speed, but also efficiency in the drilling and ploughing functions themselves. This especially applies when there is a need to guarantee construction progress with furrows and excavations in places that are difficult to access. The equipment, which also has a very easy to operate control unit, cuts its way into the earth even in conditions which force less compact machines to retreat – when faced with eaves, low-hanging branches and other obstacles.



## Powerful crawler excavator from Liebherr

The new R 313 Litronic, the smallest crawler-type excavator in Liebherr-Hydraulikbagger GmbH's current product range, combines amazing power with a compact size. The 4-cylinder 2012 engine with its 74.9 kW at 2,000 min<sup>-1</sup> provides the finest base for the many other technological nuances in the driving technology of the 14-ton unit. The sen-

Even with constantly growing demands, the engine will always be the heart of the machines



sor-controlled automatic idling mode and the fuel prefilter with centrifugal separator and a dirt particle filter system connected upstream of the air cleaner, are especially noteworthy. The drive has forceful traction, while the Litronic system combines top-class sensitivity with extreme precision and, at the same time, great power. Its range of applications, therefore, is highly diverse, which is why Liebherr offers three other variants besides the standard version, all of them equipped with DEUTZ drives.

**New arrangement for Atlas wheel loaders**

Atlas Weyhausen has rearranged its wheel loader range. The only machine that the Wildeshausen (Lower Saxony) engineering works has left unchanged is the AR 85 using the proven 68 kW DEUTZ drive. Reworked and fitted with more powerful DEUTZ engines from the 2009 series, the company is now offering the AR 50 and AR 60 wheel loaders with 42 and 47.5 kW, respectively. The

new AR 65 Super is based on a 4-cylinder variant of the TD 2011 series combined with a completely reworked hydraulic system including a gerotor pump. Also new and with a 56.9 kW-strong DEUTZ engine under the hood is the AR 75. Like all the other wheel loaders this model is equipped with new pumps for the drive and working hydraulic systems. The AR 80 features a 2011 engine outputting 59.5 kW at 2600 min<sup>-1</sup>, while the AR 95 and the AR 95 Super with their 74.9 and 92 kW, respectively, strong engines from the 2012 series, round off the impressive wheel loader range in the upper power class. Of course, all DEUTZ engines fitted in Atlas wheel loaders comply with the current relevant exhaust standards.

**Gehl's versatile telescopic loader**

The RS5-19 telescopic loader impresses with its extremely compact dimensions, excellent mobility, high precision and fine productivity. The designers at the Wisconsin (USA) firm have



1 Liebherr: Crawler R 313 Litronic 2 Atlas Weyhausen: Wheel loader AR 75 3 Gehl: Telescopic loader RS5-19 4 IR-ABG: Cold milling machine MW-500



1 Vögele: Road paver Super 1300-2 2 Bomag: Compactor BW 236 DI-4 BVC 3 Wirtgen: Cold milling machine W 100 4 Ditch Witch: Vibratory plow 420SX

developed a piece of machinery which, with a height of only 1.95 metres and a turning circle of 3.35 metres, can demonstrate its strengths where space is restricted. Even inside buildings, halls, underground car parks and other locations with restricted space, the boom, which can be extended up to 5.8 metres, can carry loads of up to 2.5 tons with no problem at all. Thanks to the different attachments, the telescopic boom cannot only be used in construction engineering, but also in agricultural applications and by other service providers. When motorising its equipment the Gehl company puts its faith in a 4-cylinder DEUTZ 2009 series engine with 48 kW at 2,600 min<sup>-1</sup>, that helps the compact machine achieve an all-round, convincing performance.



cold milling machine for removing pavement layers made up of different materials. Milling widths of between 30 centimetres and 50 centimetres give an extremely small milling radius of 20 centimetres. The customer benefits from this, for example, when repairing pavements, milling in connections and milling free manhole covers. The standard model coming with anti-slip control, the MW-500 also features the Electronic Planer Management (EPM), a patented milling machine control system. The individual drive also ensures optimal traction, while the Line Manager controls the individually torque of each wheel. This – and of course the use of a powerful 4-cylinder variant of the proven DEUTZ 2012 2V series engine outputting 93 kW at 2,300 min<sup>-1</sup> – not only ensures that the machine has perfect directional stability but, at the same time, that it operates efficiently and reliably. Thanks to an extensive package of measures, the MW 500 asphalt milling machine is also completely convincing in terms of operational safety. [jp, rr]



**New cold milling machine from IR-ABG**

Extremely powerful, compact and versatile. This was how the IR-ABG presented its new MW-500

Photo: Atlas Weyhausen, Bomag, Ditch Witch, Gehl, Ingersoll Rand Road Development, Liebherr, Vögele, Wirtgen



2010 Series

# Future option for construction sector

Environmentally-friendly, compact and extremely resilient – the new 2010 series with outputs of up to 75 kW handles the tough conditions in which construction machines operate

The standard oil change interval of the engine series 2010 is 500 hours

Whether with stationary applications, material-handling vehicles, commercial vehicles or construction machines, DEUTZ AG's robust, compact diesel engines are enjoying sustained high demand. Having begun serial production of the water-cooled 2008 and

2009 series for the lower power range of up to 50 kW in 2005, the Cologne manufacturer is now to introduce its new 2010 series with outputs of 50 to 74.9 kW, at bauma 2007. The location for this presentation suits the developers' objectives to a tee – during both the conceptual phase and the detailed design, the engineers took into account the rigorous working conditions which are part of everyday life for construction and agricultural machinery worldwide.

Option for the future

The outcome is impressive – turbocharged four-cylinder engines with a swept volume of around 3.5 litres, available with or without charge-air cooling, depending on the particular power and speed requirement. Compliance with stage 3 emissions standards goes without saying. Moreover, the Cologne manufacturer has already put everything in place so that the 2010 series will conform with the emission limits in the next stage, stage 4. In particular the direct injection, whose design is state of the art, enables the turbocharged diesel engine to meet the new and more demanding emission standards in this power range with high pressure in a very real sense.

Serial production planned for mid-2008

Further plus points include the smooth running with low torsional load and the innovative design with extremely compact dimensions and low weight, enabling the new 2010 series to offer a wide range of application options for the construction machinery sector. As well as the standard model with mechanical engine control, an electronic controller will be immediately available as an option to enable the engines to also operate in a powertrain management system. DEUTZ's proven modular system will ensure that the engines are easily adapted to different applications. As well as taking elements from the 2008 and 2009 series design, the designers placed great store on achieving compatibility with engines in the 2011 series. Since mid-2007, the new 2010 series has been undergoing field tests in selected applications prior to serial production commencing in the second half of 2008. [rr]



ENGINE   The new 2010 Series		
TCD 2010 – the engine for construction equipment	TD 2010	TCD 2010 (charge-air cooling)
Power (kW)	64	74.9
Swept volume (l)	3.47	3.47
Max. torque (Nm/min <sup>-1</sup> )	300/1,400	350/1,400
Max. speed (min <sup>-1</sup> )	2,600	2,600
Bore/Stroke (mm)	96/120	96/120

Photos: DEUTZ AG

2011 Series

# Bestseller now also available with water cooling

With integrated or external oil cooling, the most successful industrial engine of its class has already broken through the magical barrier of one million units sold. In order to again extend the application range, the 2011 is also to be made available with water cooling

Emission reduction is set to determine the future of the diesel engine", predicted the "DEUTZ Antriebe" magazine in 1988. Almost two decades on, in terms of the 2011 series this statement seems more relevant than ever before. For on 1 January 2008, the Stage 3 emission standards for industrial engines of between 37 and 75 kW will come into force. With the upgraded oil-air cooled engines – the signal will be given to commence serial production as early as mid-2007 – DEUTZ is already meeting the stringent restrictions. Furthermore, and also this year, the first examples of a more powerful variant of the classic compact engine will roll off the assembly line – from 2008, the Cologne engine manufacturer will be offering the 2011 series in a four-cylinder version with water cooling. The version for construction equipment will be available with outputs of 50, 68 and 74.9 kW at 2.600 min<sup>-1</sup>, respectively.

Cooling system

"We faced the challenge of aligning our innovations with three different customer wishes at once." This was how Werner Lemme, DEUTZ's platform manager for compact engines smaller than four litres, described the initial situation. The engineers had, in a sense, to square a triangle of expectations – greater engine power, but with the engine having unaltered installation dimensions compared with exhaust gas stage 2 and, at the same time, conformity with the tighter restrictions imposed by emission stage 3. A challenge that DEUTZ met with a mechanical injection system. The newly developed recess cylinder head, which a patent has been applied for, also provides increased swept volume at almost unchanged power output, plus more intense cooling for the cylinder head.

Enormous future potential

To give customers more application options, the water-cooled 4-cylinder variant of series 2011 has been in field tests since the fourth quarter of 2006 (see box). The signal to go ahead with serial production will be given at the end of this year. This again indicates that this series, which is also very successful in the construction machinery sector, has enormous potential in terms of meeting the challenges that engines are set to face in the future. [rr]

**Class winner** With a million engines sold since its launch in 1988, the 1011/2011 series is the most successful industrial engine of its class. As well as the integrated cooling system, the construction sector particularly appreciates the user-friendly service intervals for the toothed control belt and the compact dimensions of the 2011 engines



ENGINE   The new water-cooled version of the 2011 series			
The water-cooled four-cylinder engines of series 2011 have been in field tests since late 2006. When serial production starts towards the end of 2007, they will be available as naturally aspirated engines and as turbocharged engines, the latter optionally also with charge-air cooling. The well-established injection system pump-line-nozzle (PLN) is used here. There is also an electronic engine control option which enables it to function in a powertrain management system.			
TCD 2011 – the engine for construction equipment	D 2011	TD 2011	TCD 2011 (charge-air cooling)
Power (kW)	50	68	74.9
Hubraum (l)	3.62	3.62	3.62
Max. torque (Nm/min <sup>-1</sup> )	210/1,700	280/1,600	350/1,600
Max. speed (min <sup>-1</sup> )	2,600	2,600	2,600
Bore/Stroke (mm)	96/125	96/125	96/125

Photo: DEUTZ AG



Hybrid drive

# Power in the twin pack

Modern hybrid technology having made a breakthrough in the car sector, DEUTZ is the first manufacturer to plan to use it in mobile machinery

The hybrid drive combines internal combustion and electric engine



considerably, depending on the application. The additional power of the electric motor enables the diesel engine to be made smaller – so-called downsizing – without entailing any reduction in the equipment's power. A smaller diesel engine means reduced consumption and, thus, also reduced emissions. Exhaust gas after-treatment is also simplified. Moreover, depending on the powertrain model, temporary emission-free operations are also possible. DEUTZ is aiming to use the hybrid drive to exploit these opportunities in the mobile machinery segment. Applications with high peak performance but a lower mean load are the target for the innovative drive design. On that basis, the developers expect that the hybrid engine will be used for wheel loaders, stackers, aircraft movers and telescopic loaders. One can also envisage them being fitted in equipment such as excavators or scrap sorters. In view of the high full load ratio, DEUTZ's experts believe that it would, as yet, be unwise to fit them in compactors, tractors and drilling equipment.

Fuel consumption cut by up to 20 percent

The developers' specification book is bulging at the seams. To enable it to be marketed at a cost-effective yet competitive price, the diesel engine will only be subjected to minor changes and the machine will remain unchanged, as will the interface to the machine. This will ensure that the new drive solution can continue to be used by as many customers and applications as possible. The following system functions are important to the DEUTZ-customers:

- Start and stop: engine stops automatically when idle and automatically starts when power is needed.
- Power boost: the electric machine is switched on to cover peak power requirements and improve the engine's dynamics.
- Load battery: during operational phases, when the system only requires part of the diesel engine's output, the battery is loaded in the diesel engine's output range which is ideal for fuel consumption.
- Recuperation: braking energy is rerouted from the electric machine to the battery.

The intelligent interaction of the two drive designs enables fuel consumption to be reduced by up to 20 percent. Energy is "managed" using a permanently actuated synchronous machine integrated in the flywheel housing. The stator required here, i.e. the fixed part of the electric motor, is integrated in the SAE housing. The flywheel of the internal combustion engine is replaced by a rotor. [jp]

Photo: DEUTZ AG

**DEUTZ hybrid drive** DEUTZ customers, too, are set to benefit from the increasing use of hybrid technology in the car sector. Hybrid components such as reservoirs and power electronics are more sophisticated and readily available. Engine components such as the generator and the starter are no longer needed. Secondary benefits in terms of consumption and costs are derived from supplementary units which are electrically operated and have "engine map control", such as water pumps, oil and fuel pumps, the fan, the heating and the air-conditioning compressor

Applications with a large amount of partial load operation

The development efforts are being driven by the advantages offered by hybrid drives. The combined use of an internal combustion engine and an electric machine – which can also be operated as an engine and a generator – reduces fuel consumption

Kramer Allrad

# Talented loader

The telescopic loaders from Kramer convince with power, speed and the versatility of the extendable lifting arm

Kramer's product palette includes wheel loaders, tele-wheel loaders and telescopic loaders. Their common design principle: all-wheel steering and one-piece chassis

Up until the end of 2005, Kramer – market leader for compact wheel loaders, had exclusively wheel loaders and tele wheel loaders with all-wheel steering in their product portfolio. Today the telescopic loader series extends levels of comprehension for construction machinery with all-wheel steering by a new dimension. Thanks to the extendable lifting arm, the machine can deposit material at a great height. With its compact dimensions, the loaders open up new fields of application.

Kramer has been developing innovative solutions for the construction industry since 1925

Proven cooperation

When it comes to the drive train, Kramer relies on the well tried team work with DEUTZ. The company based in Überlingen on Lake Constance has opted to use DEUTZ 2012 series engines to power the loaders. Water-cooled, turbocharged in-line four-cylinder engines will be used. The base-model telescopic loaders will be powered by a BF4M2012, which develops 75 kW at 2,400 rpm. Alternatively, a BF4M2012C can be provided with an output of 90 kW at 2,400 rpm. A stepless transmission system transmits the power to all four wheels.

INFO | Kramer Werke GmbH

2001 marked a new era for Kramer Werke GmbH, based in Überlingen on Lake Constance: the leading manufacturer of wheel loaders with all-wheel steering merged with Neuson AG to form Neuson Kramer Baumaschinen AG, based in Leonding (Austria). Hence their new product palette does not only include mini, compact and mobile diggers, it also features compact loaders, wheeled and tracked dumpers and wheel loaders. New sectors are the tele-wheel loaders and telescopic loaders. In 2006 round about 2,500 construction machines were produced in Überlingen. With a new works at the neighbouring city of Pfullendorf with which production is to be doubled until 2010 Kramer reacts to the rise in sales.



Wherever the experts expect top performance it can rely on telescopic loaders from Kramer

Andreas Breunig, Product Manager at Kramer: "The telescope range has been designed for power and speed." Thanks to the all-wheel steering, they can almost turn on the spot. In addition, the lifting arm can be retracted completely into the U-shaped frame, allowing the operator clear vision. The top model 4009 with a loading height of nine meters and a net load of up to four tonnes can prove its capabilities especially at building construction sites. With a longer wheelbase

than the six and seven-metre telescopic loaders the 4009 does not need to deploy supports at its maximum loading height. "This was especially important for the nine-metre telescopic loader to work flexibly and rapidly", explains Breunig. For maximum stability even on difficult terrain, Kramer offers self-levelling and a swing axle lock on its top-of-the-range telescopic loader. If both of these are activated, the lifting arm can lift a load of up to three tonnes up to the impressive height of nine metres.

Besides innovations in the wheel loader segment Kramer plans to further expand the telescopic loader business

Great potential for the future

Together with the wheel loader segment the success story of the telescopic loaders is the basis for the expansion of the Kramer works. Production is planned to start at the new location in Pfullendorf in 2008 – new peak performance is sure to come. [rr]

Photo: Kramer Werke





Tunnelling work at Amsteg (Switzerland): huge machines cut away at the mountain to create the new Gotthard Base Tunnel

Tunelling

# Breaking through

In response to the rapid growth of passenger and goods transport in Europe, most EU countries are turning to tunnel construction. Right now, enormous machines are daily burrowing away beneath the continent, and DEUTZ engines are on the spot when the breakthrough comes

With machine manufacturers from around the globe, DEUTZ is forever looking for new ways to make underground working and tunnelling more effective. Power units, vehicles, explosives charging equipment and loaders – underground construction sites require a large number of machines of different sizes and capabilities. This applies to both tunnelling and traditional mining. With 40 per cent of the international market, DEUTZ engines are in evidence in just about all construction projects of this type.

Powerful and versatile

The application examples in which the power trains from Cologne have proven their capabilities are therefore manifold. So diesel engines from DEUTZ's robust, dependable 2012 and 1013 series help the Sandvik-Tamrock "Axera T" model achieve maximum drive below ground. Sandvik Tamrock has been making boring machines since the early 1980s. Depend-

ing on the customer's needs, the "Axera T" range can be either semi or fully automatically controlled.

The concrete sprayers of the Normet corporation give evidence of the capabilities of their machinery. The Spraymec 9150 can be used with extreme flexibility in tunnels with profiles of 15 to 200 square metres and a height of up to 15 metres. The Spraymec 9150 is fitted with a powerful pump driven by a DEUTZ series 2012 diesel engine. The sprayer can dispense up to 30 cubic metres of concrete per hour.

The name of Atlas Copco has long been a byword for excellence in the constructing and boring technology industry. The Swedish operation has its own companies in 70 countries around the world. In another 80 countries, sales are handled by dealers or service networks. Its machines and other products are made in 13 different countries. And Atlas Copco, too, has faith in the power and efficiency of DEUTZ engines. So they install the 1013 series and its successor, the TIER 3-compatible 2013, in their "Rocket Boomer". [jp]

Photo: Alp Transit AG

**The longest tunnel in the world** From 2016 on two new tunnels with a length of 57 kilometers are to be cut through the Gotthard range in Switzerland. Overall the tunnels will measure 153.5 kilometers

Future of the combustion engine

# Emission legislation separates the wheat from the chaff

Exhaust emission standards are becoming more and more demanding and determine the development work of engine manufacturers. Karl Huebser, responsible for Technology on the DEUTZ Management Board, explains how the company faces these challenges

Mr Huebser, is emissions legislation a curse or a blessing for engine manufacturers?

**Huebser:** When you see that since 1993, the year in which the Euro I standard was introduced, emissions from diesel engines in commercial vehicles have fallen by up to 90 per cent and that a reduction of roughly 60 per cent has been achieved for industrial motors in eight years, this is of course, a very positive thing for all of us. As an international engine manufacturer, we benefit from the development pressure imposed by emissions legislation. It separates the wheat from the chaff; you can only survive in this hard-fought competitive market if, like us, you are innovative and invest appropriately in advanced technologies.

Has development work changed compared with former times?

The demands are clearly greater than 15 or 20 years ago. For one thing, development cycles are becoming ever shorter, meaning that we always have less time to implement technical improvements. For another, it's a question of balancing our customers' wishes for better performance and lower consumption with the constant lowering of the limits in emissions legislation.

Which fuel will DEUTZ engines be burning in ten years?

We shall probably first see further optimisation of diesel fuel, for example, a significant reduction in the proportion of sulphur. Then, the proportion of synthetic fuels will also grow in the next few years, both the GTL fuels, produced

from gaseous raw materials, and the BTLs or sunfuels, based on biomass. And finally, hydrogen may well come to the fore, whether used in the internal combustion engine or in the fuel cell.

What is your estimate of the chances for alternative drives?

There is no other drive concept at present which is a match for the internal combustion engine as regards versatility, reliability and economic efficiency. The technology is fully mature and the internal combustion engine still has much optimisation potential as far as consumption and emissions are concerned. It also has the great advantage that it can be run on many different fuels ranging from petrol to RME (i.e. biodiesel) to hydrogen. The hydrogen engine and the fuel cell will only achieve

large scale success once the technical and commercial problems of generating and distributing hydrogen have been solved. In contrast, we shall pretty soon see the hybrid drive in non-road applications (see page 10).

Is DEUTZ well prepared for implementing new technologies?

We can look back on over 140 years of experience in engine construction; our engines are capable of using RME fuels and we are working hard at employing hybrid technology in mobile machinery. We are conducting pilot projects to research the potential of the gas engine and of the hydrogen-powered internal combustion engine and the fuel cell. Yes, we are well prepared for the future and we shall continue to play an active part in shaping it. [sr]



Photo: DEUTZ AG

**Karl Huebser** (left) was born in Freienfeld (ITA) on 8 May 1945. After completing his studies of automotive engineering he held several executive positions at AUDI AG at the locations Ingolstadt and Shanghai (CHN) and was Managing Director of AUDI HUNGARIA MOTOR Kft. in Győr (HUN). Since August 2001 he is a member of the DEUTZ AG Management Board, responsible for Technology





Extended maintenance intervals by the newly developed oil diagnosis system

Oil and Filtration

# Quality makes the difference

Mobile machinery claim a lot from modern engines and the applied lubricants. DEUTZ stands up to the challenge with an innovative oil and filter management

DQC I-02 defines the released minimum oil quality

DEUTZ clearly considers the service business to be the differentiation characteristic with regard to the competition. With a series of projects the Cologne engine manufacturer continuously improves its range of services for the customers. The marketing of engine specific lubricants plays an important role in this strategy.

Quality criterion DQC

DQC II-05 describes the Standard Lubrication Oil Quality for DEUTZ engines with open crankcase ventilation

Subjects such as oil and filtration ultimately accompany engine manufacturer and customer throughout the engine's entire working life. The conformance with the prescribed maintenance intervals not only extends the working life, but it also increases the availability for use of the engines. A total of four quality classificati-

ons have been created and named after the year of publication and the requirements. The company recommends the use of the DQC oils because unsuitable oils can oxidise and lose their flow characteristics. This can lead to very expensive engine damage.

Competent oil diagnosis

In order to provide for a smooth running of the engine DEUTZ established an oil diagnosis system (DOD). With this system standard oil change intervals can be extended up to 100 per cent to a maximum of 1,000 hours of operation. The oil to be analysed is extracted and sent to a laboratory for diagnosis. The result is available 24 hours after receipt and depending on the wear situation of the engine

the oil change interval can be extended.

Beware of cheap products

The demands on filtration by modern engines have also increased as a result of elevated temperatures and increased contamination incorporation. Operators have to be careful with replacement filters. The use of cheap pattern filter inserts can lead to very expensive engine damage.

Conclusion: Reliable operation of DEUTZ engines can only be ensured by the use of original DEUTZ media. The oil and the filters are important elements whose correct use and replacement are decisive factors for the reliability and efficiency of the engines over their entire working life. [jp]

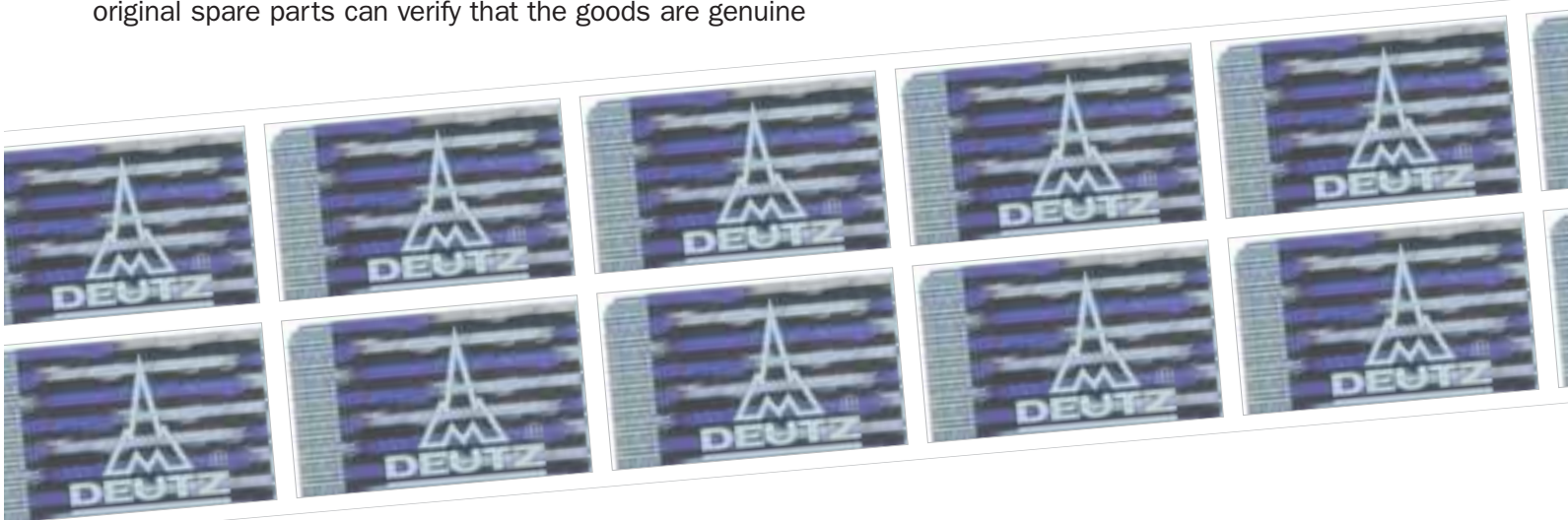
Oils from the classification DQC III-05 and DQC IV-05 are required for high-load engines with enclosed crankcase ventilation

Photo: DEUTZ AG

Security tags

# Double the protection

The growth in product piracy has had a particular impact on major brand manufacturers. With DEUTZ's new part number labels, buyers of original spare parts can verify that the goods are genuine



The redesign of the packaging for original DEUTZ spare parts for DEUTZ Compact Engines (DCE) and DEUTZ Power Systems (DPS) in 2006 provided a welcome opportunity for the engine manufacturer to counter-attack international product piracy. "We managed to integrate several security components into our new part number label. This enables all our customers to verify that the boxes don't simply say DEUTZ, but that they actually contain DEUTZ products," explains Stefan Küster, Head of Product Management After Sales. Each box has, as a first stage of the security process, a tag with a hologram with a series of nested DEUTZ logos and a three-dimensional micro-text that changes its colour depending on the angle you look at it. In order to check the second security level you use a standard UV lamp, like those for checking banknotes.

However, the case is far from closed for DEUTZ's security experts. Strictly speaking, these two security levels only serve to confirm that the newly developed part number label is genuine. But to prevent product pirates from removing a DEUTZ seal from the original packaging and using it, without permission, to increase the value of their goods, the edges of the tag also have small perforations. These ensure that the label's main features are ruined if an attempt is made to remove it.

The new part number label gives customers a certainty that they have actually received the product quality they were counting on. It also provides a form of insurance for warranty claims. [erp]

**Plagiarism** The European Commission has estimated that counterfeit goods account for between five and nine per cent – up to 400 billion euros – of global trade. According to the certification organisation TÜV Rheinland the German economy suffers a loss of 30 billion euros each year

**Balance** In 2002 goods to the value of 76 million euros were confiscated in Germany. In 2006 the counterfeit goods confiscated in the Hamburg harbour alone accounted for 490 million euros. The German Association of Chambers of Commerce and Industry estimates that 70,000 jobs are lost each year in Germany due to product piracy

INFO | Packaging, holograms, luminescence

Since 2006 the dispatch boxes for DEUTZ Compact Engines (DCE) and DEUTZ Power Systems (DPS) have a standardised design. The four outer sides have the relevant logo and the slogans "The Engine Company" (DCE) and "Concentrated Energy" (DPS) printed on them.



New standardised packaging for DCE and DPS

On the new part number label the colour of the hologram changes as it is viewed from a different angle. Under black light the DEUTZ logo changes colour and appears in red. Along the edges of the part number tag there is a perforation that prevents the security label from being detached.



UV light clearly shows up the security features

Photo: DEUTZ AG



**We love engines.**



**The engine company.**

