Automotive
Test
Systems

ESPRIT

Issue 01/2011

Highlights:

Interview with Joachim Misgeld, HORIBA test centre in Oberursel

HORIBA CONCEPT Conference Report

Dear readers,

2010 was a really good year for HORIBA. The Testing Expo 2010 and our customer seminars were a great success. The trail-blazing technologies which we have put onto the market are currently meeting with great interest amongst our customers and the media. This puts us in the best position to meet the demand for increasingly powerful measurement and simulation tools. Our presence in the media is growing constantly too. In 2011, we will be further expanding our capabilities and we have already broken new ground. Our HORIBA CONCEPT conference in Dresden, which we organized in cooperation with Dresden University of Technology, was a great event. This was due to the attendance of leading industry speakers, with whom we were able to create a high-quality program. The upcoming modernization of our test centre, including a new E-motor test stand, will allow us to set up a HORIBA competence centre in which we can forge ahead with our global developments. I would like to take this opportunity to thank you for your trust and the excellent cooperation.

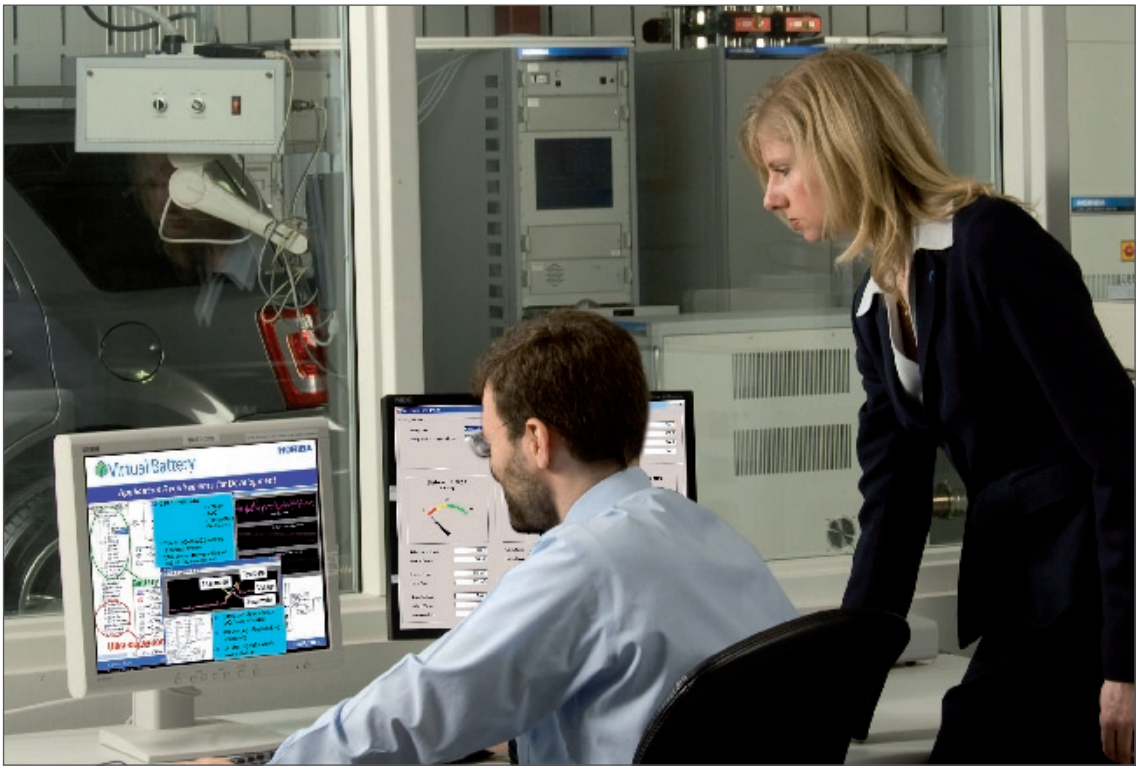
Yours, Axel Wendorff

HORIBA
Automotive Test Systems

News

Virtual battery system

More information:
Andy Keay
+49 (0) 6151–5000-1439
andy.keay@horiba.com



The virtual battery system simulates different individually parametrised battery models.

The virtual battery system from HORIBA simulates not only the battery's state of charge but also a wide range of other parameters, including age of the battery, driving cycles, environmental influences and composition. In this configuration, the innovative system proves an effective tool for predicting the actual battery behaviour. The system offers a total of five different battery models. In addition, an efficient model generator allows individual battery profiles to be created, thus ensuring maximum testing flexibility. The virtual battery system is available as an all-in solution with perfectly matched hardware, software and security features, but it can also later be applied to existing battery cycle systems to allow improved battery emulation.

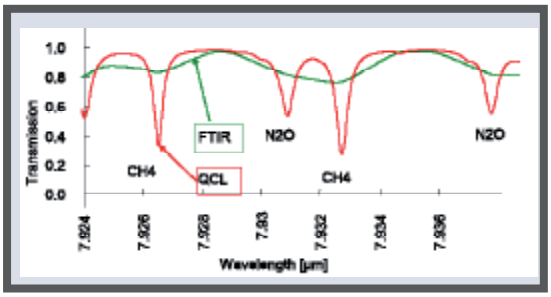
HORIBA is a new member of the FISITA Honorary Committee

For a short time now, HORIBA has been a member of the well-respected international FISITA (Fédération Internationale des Sociétés d'Ingénieurs des Techniques de l'Automobile) Honorary Committee. At the invitation of the executive board, HORIBA and four other large Japanese companies have been accepted into the FISITA Honorary Committee. One of the reasons for the nomination was HORIBA's leading position worldwide in the field of exhaust gas measurement technology. As the global umbrella organization of automotive engineers, FISITA represents more than 160,000 engineers worldwide. The FISITA Honorary Committee is composed of the board of directors of the world's largest automotive and automotive supply companies, the goal being to promote efficient, safe, sustainable and affordable automotive transport.

MEXA-1400QL-NX

The MEXA-1400QL-NX system is a completely new development in the field of emission measurement. This innovative test system utilizes four Quantum Cascade Lasers (QCL) to detect the primary nitrogen compounds in the exhaust gas, thus allowing the engineers to analyze the effectiveness of exhaust gas aftertreatment devices. In comparison with other exhaust gas emission measurement technologies, the QCL is in a position to detect even extremely low concentrations of NO, NO_2, NH_3 and N_2O in the exhaust gas stream precisely and with virtually no interference from other gases present there. The laser also provides excellent measurement accuracies over a very wide measuring range. Thanks to a heated sample handling system, the response time of the laser remains well within the strict EURO VI limits during NH_3 measurements. This allows the QL-NX measuring unit to cover an extremely wide range of applications, from engine calibration to the development of aftertreatment devices for complex powertrains with alternative fuels.

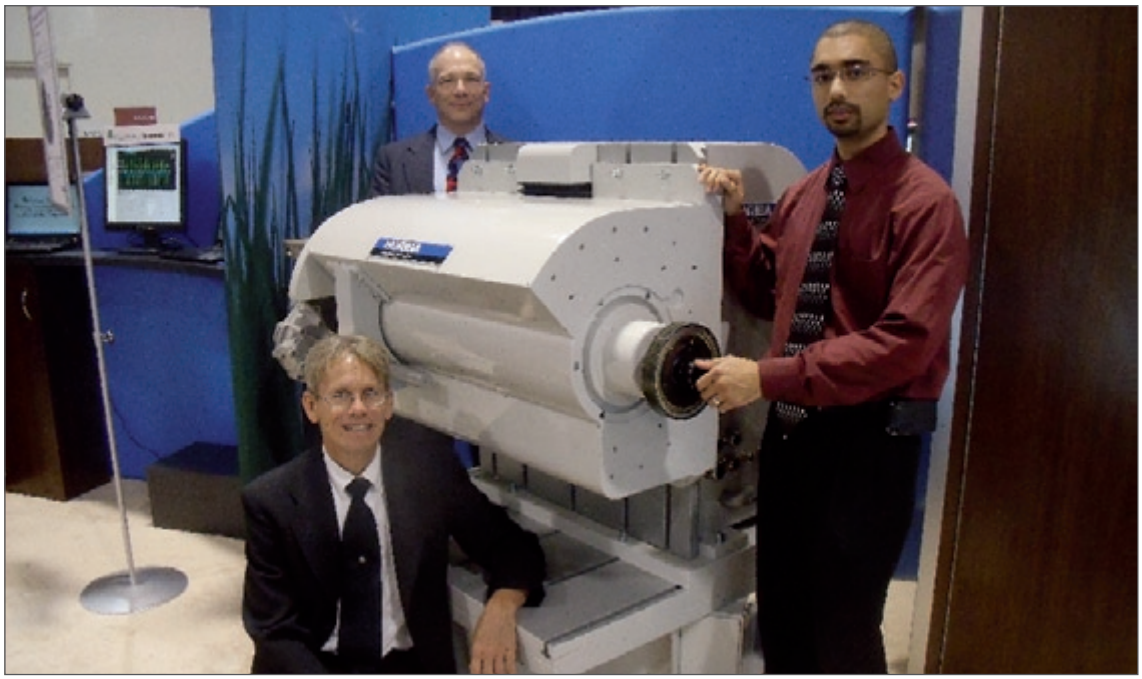
More information:
Andy Keay
+49 (0) 6151–5000-1439
andy.keay@horiba.com



The ultra fine resolution of the QCL leads to sharp peaks.

Patented harmonic damper

Up to now, HORIBA dynamometers are resonance-free up to 200 Hz and measure torque and power output up to a frequency content of 20 Hz.
However, detecting torques with regard to wear, vibrations and parasitic losses now requires a bandwidth of 1000 Hz and more, whereas 100 Hz used to be completely adequate in the past. In order to reduce the vibrations and meet the increased requirements of the customers via superposition of the various frequencies, HORIBA has now developed a harmonic damper which prevents the dynamometer from causing artefacts at high torques. HORIBA was given an US patent for adapting this technology, which is normally used in the field of combustion engines, to dynamometer technology. HORIBA applies the damper to the unconnected end of the dynamometer. It uses the natural frequency of the dynamometer and applies a diametrically opposed oscillation. These diametrically opposed oscillations of the same frequency reduce the excitation of the natural frequency of the dynamometer and the resulting vibrations. Interfering effects of the damper on the test result are ruled out by installing it at the unconnected end. In addition, the damper is subject to virtually no wear at all as it is not burdened by the connecting forces between dynamometer and equipment under test.

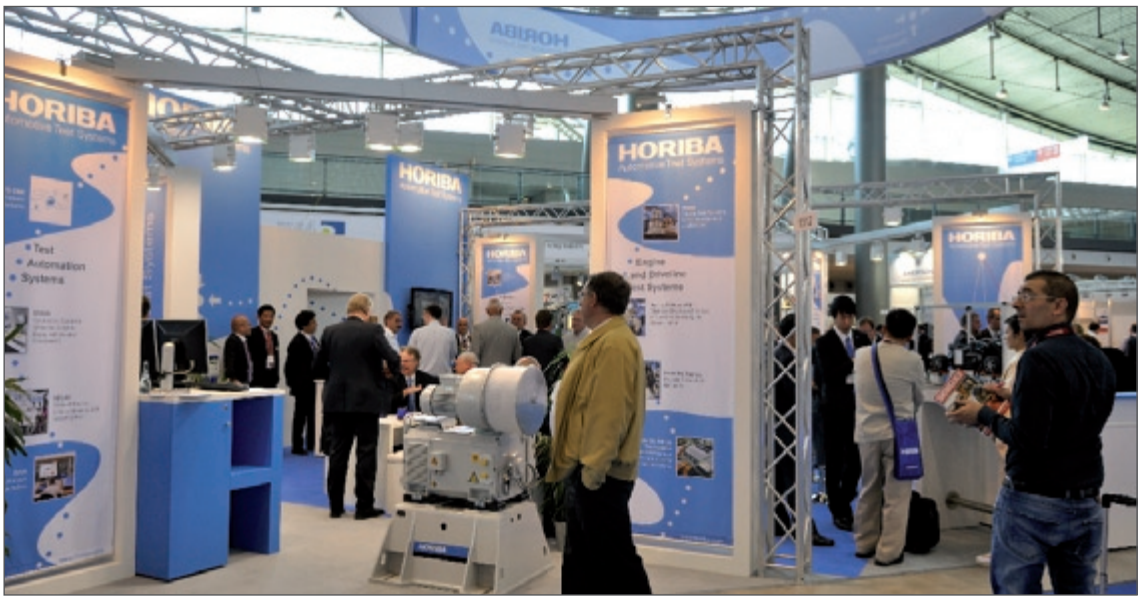


Inventors (left to right): Bryce Johnson, Norm Newberger and Isaac Anselmo.

HORIBA at the Testing Expo 2010

European premiere of MEXA-1400QL-NX exhaust gas measurement technology based on a Quantum Cascade Laser attracts great attention worldwide

More information:
Sandra Taresch
+49 (0) 6151-5000-3098
sandra.taresch@horiba.com



The HORIBA booth attracted a large number of interested customers and specialist journalists.

At the Testing Expo Europe 2010, HORIBA again presented itself with an impressive booth which attracted a large number of interested customers and specialist journalists. At booth 1512 in Hall 1, the HORIBA experts gave information on the latest products of the company. In addition to the booth, HORIBA also sponsored the official internet zone in the exhibition hall. Many visitors used this opportunity to gain insights into the latest HORIBA developments at Europe's leading specialist fair for testing and development technologies. "The demand for our technologies is growing constantly. Many discussions with customers and the increasing interesting dialog with the specialist audience demonstrate that the Testing Expo is one of the most important exhibitions of the year for us", said Andy Keay, Manager PR and Marketing, HORIBA Europe.

During its European launch, the new MEXA-1400QL-NX attracted great attention.

Highlights

At the SAE Congress 2010 held in Detroit in the USA, HORIBA had presented the capabilities of Quantum Cascade Laser technology (QCL) for emission measurement. Now, at the Testing Expo, HORIBA introduced the first ever emission measurement unit based on this technology which is able to detect nitrogen compounds in the exhaust gas. During its European launch, the new MEXA-1400QL-NX attracted great attention of the visitors. A total of four individually configurable QCL elements in the MEXA-1400QL-NX detect the NO, NO_2, N_2O and NH_3 compounds in the exhaust gas. The measurements are more precise and cover a wider measuring range than conventional measurement technologies are capable of.

Award for virtual battery system

Another highlight among the new products presented was the virtual battery system allowing complex battery conditions to be simulated. This software solution had already

been awarded in the context of the SAE Automotive Engineering Awards 2010, and now the editors of the specialist magazine "Automotive Testing Technology International" have presented it with an innovation award. "In addition to the QCL technology, the virtual battery system is one of our most innovative products. It allows users to speed up the development of alternative powertrains in a sustainable way, thus reducing the development costs considerably", said Andy Keay.
For this purpose, the virtual system simulates battery packs which are designed in accordance with the specific requirements of the various powertrain types by the test engineers. The virtual battery system thus allows test runs of alternative powertrains to be conducted long before series production of powertrain and battery starts.

Axel Wendorff, Vice-President of HORIBA Europe was available for discussion at the booth.

New compact systems

The new TITAN and GIANT compact systems significantly expand the testing options offered by existing test cells. In particular the option of using them for existing systems to extend capabilities was much appreciated by the interested persons attending the Testing Expo. HORIBA also presented a new electrical brake actuator, the HORIBA HBA 2100, which meets the requirements of most stringent standards such as the GM Test Improvement Process (TIP).

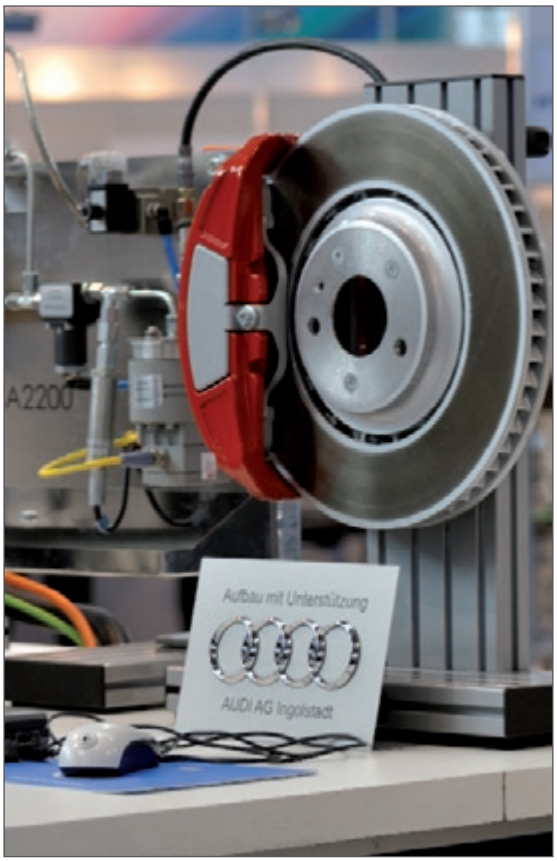
High-ranking HORIBARIANs on location

With such a wide range of innovative technologies, it is only natural to expect high-ranking representatives of the company to be present. Axel Wendorff, Vice-President of HORIBA Europe was available for discussion at the booth and was impressed by the expertise of his employees and by the great interest shown by customers visiting the HORIBA booth. Furthermore, the president of HORIBA Europe, Mr. Takashi Nagano, attended the Stuttgart event and offered a positive summary.

South African magic on the Neckar tour

As in the last years, HORIBA invited its business partners and customers attending the Testing Expo to the boat tour on the river Neckar which has already become a tradition. In a relaxed atmosphere and with beautiful weather, about 150 customers and HORIBA employees had an enjoyable evening together and wound up an interesting day at the Expo in style. The Neckar tour provided the opportunity to obtain information on new HORIBA products and services far away from the hustle and bustle of the fair while celebrating many years of successful cooperation. A varied program provided entertainment and an enjoyable atmosphere on the "MS Wilhelma". In particular conjurer Martin Eisele fascinated all those present with numerous magic tricks. For football fans there was the on-deck live broadcast of the preliminary round of the German national team at the World Cup in South Africa. With its 1:0 victory against Ghana, the German team confirmed its reputation as a tournament team and celebrated qualifying for the quarter final – for the guests on the "MS Wilhelma", of course, this was one more reason to celebrate.

After the great success of the last few years, we will be at the Testing Expo in Stuttgart in 2011 again. Be sure to visit us in Hall 1 at our booth 1512 between 17 and 19 May 2011. We will be glad to present our new products to you there in a personal talk. We are looking forward to seeing you!



The new electrical HORIBA HBA 2100 brake actuator meets the requirements of most stringent standards such as GM TIP.

“We have to think more globally and focus more on the international markets”

Interview with Joachim Misgeld, Manager HORIBA test centre in Oberursel

„The stronger interlinking of the product groups in the test centre allows HORIBA to better adjust to the individual needs of the customers.”

Joachim Misgeld has been the new manager of the HORIBA test centre in Oberursel since 1st September 2010. Misgeld has had years of experience in the field of engine development and last worked for TOYOTA Motorsport GmbH in Marsdorf, Cologne, where he was in charge of performance development for new racing engines.

How many dynamometers are there at the test centre in Oberursel?
Our test centre currently consists of a vehicle dynamometer and two engine dynamometers which can also be hired by customers.
In the near future we will be replacing one of the two engine dynamometers by our new generation of E-motor test stands. In conjunction with our virtual battery system, which simulates different battery behaviours, this will give us a high-performance, trail-blazing test facility which will allow us to test alternative powertrain technologies, probably as of early summer.

What is the target group of the test centre?
The test centre is oriented towards users of our technologies and software solutions as well as external customers, on whose behalf or in cooperation with whom we carry out test runs under precisely specified conditions. We also support universities and student projects. In the past we have worked intensively with the Formula Student Racing Team of Darmstadt University of Applied Sciences. We have an inquiry for 2011 too, and we would naturally like to follow it up. Both sides profit enormously from cooperations of this kind.

To what extent are cooperations important for HORIBA?
Cooperations with universities and student projects are important for all concerned. Students make use of our expertise whereas we actively approach universities, generating research projects from these cooperations in addition to finding potential future employees. However, test series with commercial customers can be of great benefit too. On the one hand, we provide a dynamometer on attractive terms, allowing customers to carry out their test runs on our premises. On the other hand, we as manufacturers profit from the knowledge gained in this way, putting us in a position to optimize existing products or develop new ones.

What is the main challenge for you as manager of the test centre?
HORIBA is mainly known for emission measurement technologies. When Schenck DTS was acquired, engine and vehicle dynamometers were added to the portfolio. The aim of the Oberursel test laboratory is to combine these two sectors of technology and define the challenges and requirements, especially from the perspective of the engine developers. I function as the interface, as it were, between both fields of development.

Will HORIBA be acting as a system supplier in the future?
The stronger interlinking of the product groups in the test centre allows HORIBA to better adjust to the individual needs of the customers. This also optimizes the interaction between our various products and locations and increases our ability to present ourselves as a supplier of complete systems.

What are your plans for the future?
The Oberursel test centre is increasingly being expanded to become a competence centre for the international efforts of HORIBA ATS. Developments coming from the US and Japan are also tested and applied there. Our aim is to increase our own know-how and actively promote research. This can best be done via cooperation between all HORIBA locations. We have to think more globally and focus more on the international markets.

More information:
Joachim Misgeld
+49 (0) 6172-1396-180
joachim.misgeld@horiba.com

Yes, we'll do it again

The first HORIBA customer seminars in Germany prove to be extremely popular

As a reaction to the great demand, HORIBA Europe held a series of customer seminars for the first time in Germany in 2010. As an expanded service for its business partners, HORIBA used the opportunity to give information on innovations in the field of testing technologies. A total of three one-day events took place in Germany from 9th to 16th of November 2010. The seminars in Stuttgart, Munich and Seeheim near Darmstadt were addressed to people working in companies and universities and covered various subjects from the fields of emission measurement and powertrain testing. Several presentations dealt with the combined themes of emission measurement and the development of hybrid powertrains. HORIBA also laid special emphasis on the effects of international legislation, for instance the EPA directive 1065 on vehicle testing and emission measurement, which is of fundamental importance for many customers. In addition, an extensive thematic session dealt with the quantitative measurement of particles.

Overwhelming interest

The reaction to the first letter of invitation was overwhelming: in the first five hours after sending it out, HORIBA received over 30 applications. Employees of approximately 40 different companies and universities from all over Germany attended the seminars. From the numerous attendees, a number came from far afield: visitors from Aachen, Berlin and Wolfsburg attended, as did others from Coburg and Cologne. In a relaxed but professional atmosphere, the HORIBA speakers presented the audience with information on many new and interesting topics. In particular the presentations on trail-blazing testing technologies for alternative powertrain forms and on international legislation met with great interest among the participants. The schedule also left sufficient space for specialist discussions among the participants and the speakers. This was seized upon by those present, leading to a large number of interesting conversations on the margins, too.

Full marks all round

In the evaluation carried out after the seminars, all participants praised the high quality of the events. They all agreed that the seminars offered were an important element which HORIBA should continue and expand in the years to come. The participants were also interested in HORIBA's using the seminars for regularly presenting new products of their own. HORIBA is glad to respond to this request: the dates for the seminars to be held in the year 2011 were already fixed in late 2010. HORIBA will thus be fulfilling the requests of the participants and doing what it can to obtain guest speakers in addition to its own qualified employees in future, all with the aim of progressively expanding the range of seminars offered.

More information:
Sandra Taresch
+49 (0) 6151-5000-3098
sandra.taresch@horiba.com

The participants agreed that the seminars should continue and expand in the years to come.

The presentations on trail-blazing testing technologies for alternative powertrain forms met with great interest.

All under one roof

Test automation controls test cells at the TÜV SÜD exhaust emission laboratory in Heimsheim near Stuttgart

More information:
Hans Motzkau
+49 (0) 7158-9338-15
hans.motzkau@horiba.com

Emission measurement systems for bag measurements …

The subject of emissions is becoming more and more important for the automotive industry. The constant tightening of the legal limits and regulations for test procedures forces manufacturers to develop low-emission powertrain concepts. Against this background, the German technical inspection authority TÜV SÜD in cooperation with HORIBA has set up a new centre for exhaust emission measurements at Heimsheim near Stuttgart which was completed by the addition of ultra-modern HORIBA components. TÜV SÜD also commissioned the experts from HORIBA to manage the move from Böblingen to Heimsheim and take the test laboratory into operation.

Direct in-situ management of the order

"Our strong presence in the Stuttgart area and our commitment to leading manufacturers such as Daimler or Bosch are ultimately what tipped the scales in our favour," says Hans Motzkau, Area Sales Manager, HORIBA Automotive Test Systems. HORIBA stage-managed the entire move of the laboratory from Böblingen, using its technological know-how and its made-to-measure solutions to ensure that the new exhaust emission laboratory is one of the most modern facilities of its kind in Europe. TÜV SÜD tests emissions and fuel consumption of up to 80 series vehicles and prototypes, mainly from premium German manufacturers, in Heimsheim every week.

VETS ONE Test Automation controls lab system

The core element of the new test laboratory is the tried-and-tested HORIBA VETS ONE Test Automation. This controls all test cells in the exhaust emission laboratory and is characterized by the great variety of test systems which can be integrated. In this way, HORIBA was able to combine the existing test technologies from different manufacturers with new technologies such as the emission measurement systems HORIBA MEXA 7000 and 9000 for bag measurements and the all-climate HORIBA four-wheel drive dynamometer. Besides the integration and control of the test cells, the VETS system also provides the option of developing customer-specific drive cycles. TÜV SÜD also carries out test runs in accordance with international standards.

Improved economy

The systematic separation of test preparation, test run and evaluation allows different test phases to be carried out at the same time. This is especially important against the background of the Conformity of Production (COP) test series. As these test runs are very time-consuming at an average duration of twelve hours, the opportunity of working simultaneously in other test lines is important for the efficiency and profitability of the laboratory.

High-precision measurement technologies

In addition to automation system, HORIBA supplies modern, high-precision testing technologies. The MEXA 7000 and 9000 emission measurement systems for bag measurements and a modified four-wheel drive dynamometer which was additionally coupled to a cold test chamber qualify the laboratory for all tests required by the worldwide exhaust gas standards. They include durability tests, idling tests and low-temperature tests. TÜV SÜD conducts the latter by simulating temperatures as low as -15 °C, thus allowing test series to be carried out in accordance with legal regulations which differ worldwide. Klaus-Peter Brunner, Manager of the TÜV SÜD exhaust emission laboratory for environmental and powertrain technology, said: "The automation system as well as the testing tools from HORIBA make the TÜV SÜD laboratory one of the top high-performance facilities in the whole of Europe. Thanks to the smooth realization by HORIBA, the tour de force of moving from Böblingen to Heimsheim while keeping test operations running has been a resounding success."

… and a modified four-wheel drive dynamomenter qualify the laboratory for all tests required by the worldwide exhaust gas standards.

The height of perfection

Exhaust gas measurement technology for new BMW altitude test chamber

In 2010 the official opening of the BMW Energy and Environmental Test Centre (ETC) in Munich was celebrated. The ETC not only sets new standards with regard to efficiency and sustainability but also allows more realism in the tests which can be carried out there. HORIBA know-how was required for the equipping of the altitude test chamber.

With turbocharged engines it is particularly relevant to investigate engine behaviour at high altitudes as differing environmental air pressures require the turbocharger pressure to be adapted constantly. An altitude test chamber in the new test centre simulates changing pressures which occur in different heights. With an emission measurement system based on the MEXA 7000 series, HORIBA supplied the equipment necessary to allow BMW to carry out complex emission measurements too.

HORIBA supplied also the peripherals necessary for diluted measurements.

Stationary emission measurement technology

The extensive HORIBA technologies used in the altitude test chamber make it the one and only test cell in the ETC to include integrated measurement technology on a very high level. The measurement technology intercepts consumption and emission data relevant for approval under the aspects of altitude and temperature and is suitable for measuring and minimizing vehicle emissions as early as the pre-series status. The CVS 7400S system developed and installed by HORIBA also detects low concentrations of emissions as prescribed by future legislation.

Comprehensive emission measurement technology

HORIBA supplied BMW with a complete measurement system which includes not only the equipment but also the peripherals necessary for diluted measurements. Besides the dilution tunnels, heaters and fans, this also includes the entire gas supply. The measuring units used are a CVS 7400S Constant Volume Sampler (CVS) and a MEXA 7400 2-line exhaust gas measurement system. The latter is suitable for raw sampling as well as diluted measurements, thus making it a good addition to the CVS system, whereby a fixed gas fraction is stored in sampling bags. The engineers analyze these samples after completion of the test cycle and determine the integral exhaust gas compounds as well as the pollutant values resolved according to time.

Extensive services

The development of the automation software for the emission measurements was a particular challenge. It was integrated as a subsystem into the existing test automation and is responsible for controlling the measurement tasks dynamometer-specifically, calculating the exhaust gas values and documenting the course of the tests. In addition to the supplying of the different test systems, the engineers from HORIBA also took charge of the entire engineering and the installation of the complete system. Furthermore, HORIBA was responsible for documentation and final acceptance.

Expanded field of application

With the measurement technology in the altitude test chamber, investigation of fuel-consumption reducing measures outside of the legal test cycles is possible too. Furthermore, the emissions which escape via the tank ventilation can be measured. The gases released here must on no account be introduced into the environment, instead being supplied to the engine and combusted there. In addition, the altitude test chamber at the ETC makes a fundamental contribution to the fine tuning of the vehicle.

Years of successful cooperation

The all-in package supplied by HORIBA includes engineering and planning, installation and acceptance in addition to the measurement technologies and makes the BMW altitude test chamber at the ETC an important tool for reducing the emissions of vehicle powertrains. At the same time, the project is the latest in a series of successful developments realized in the course of long years of excellent cooperation between the two companies.

More information:
Wolfram Brandemann
+49 (0) 89-2444779-0
wolfram.brandemann@horiba.com

At the ETC, a HORIBA CVS 7400S Constant Volume Sampler (CVS) and a MEXA 7400 2-line exhaust gas measurement system are installed.

First HORIBA CONCEPT conference was a success

HORIBA and Dresden University of Technology organized panel of experts on particles and CO_2 emissions in Dresden

More information:
Sandra Taresch
+49 (0) 6151-5000-3098
sandra.taresch@horiba.com

On 1st and 2nd February 2011, HORIBA held the first HORIBA CONCEPT conference in Dresden. In cooperation with the chair for combustion engines, Prof. Dr-Ing. Hans Zellbeck at Dresden University of Technology, interesting subjects were discussed.
The name "CONCEPT" stood for the program: **Con**ference for **C**ombustion, **E**missions, **P**articulates and **T**esting. The thematic focuses of the conference included the assessment of emission potentials, possible measuring principles as well as strategies for emission reduction. Furthermore, the topics of vehicle calibration and evaluation of drivability were discussed.

Rising challenges for the automotive industry

The automotive industry is now focusing on compliance with increasingly stricter emission limits. The standards regulate not only CO_2 emissions but also the reduction of particles produced during the combustion process.
An extension of regulations to non combustion related particle emissions, which are produced for instance during braking, can not be excluded. Furthermore, this reduction of the limits aimed at makes a further increase in the test complexity probable, as the World Harmonized Transient Cycle (WHTC) shows. These new requirements in conjunction with the implementation of hybrid powertrain systems increasingly require a holistic study of the motor vehicle as an entire system.
"Recuperation, powertrain strategy and driving comfort must be optimized more and more. A well-founded exchange of know-how and experience such as that provided by our conference makes an important contribution to these efforts," stressed Prof. Dr. Marcus Rieker, responsible for scientific cooperation at HORIBA Europe, in the context of the HORIBA CONCEPT Conference.

Stated experts

The conference was divided up into a total of three topics. Besides information on particle emissions caused inside and outside the engine as well as CO_2 emissions, a special series of presentations was devoted to calibration and driving assessment. After the opening of the conference by Prof. Zellbeck from the chair for combustion engines of Dresden Technical University and Dr. Kozo Ishida, executive Vice-President HORIBA, numerous guest speakers from well-known companies and university chairs gave presentations. Besides experts from BMW, Bosch, Continental and Daimler – companies with which HORIBA has been cooperating excellently for years now – the organizers

The presentations made by the stated experts covered a wide range.

The relaxed atmosphere provided opportunities for discussions at the margins of the plenary sessions.

were also able to recruit high-ranking representatives from science and research facilities such as the Research Institute for Automotive Engineering and Vehicle Engines Stuttgart (FKFS) to make presentations.
For the Research Institute of Automotive Engineering and Vehicle Engines Stuttgart (FKFS), Prof. Dr. Michael Bagende gave a presentation which dealt with the development of a hybrid powertrain with a turbocharged CNG engine and met with great interest. In addition, Dipl.-Ing. Lars Mönch from the Umweltbundesamt contributed with a fascinating presentation on possibilities to reduce emissions and save energy in everyday traffic circulation.

Wide range of topics

The presentations made by the stated experts covered a wide range. Besides methodical accounts such as the detection of brake dust in dynamometer experiments (Prof. Dr.-Ing. Klaus Augsburg, Faculty of Mechanical Engineering, Automotive Engineering, Technical University of Ilmenau) or comparative particle measurement for different organic fuels ((Dr. Uwe Hofmann, Vehicle Technology Research Institute, Dresden University of Applied Sciences), a few presentations were also devoted to the existing and new basic legal conditions. Furthermore, well known manufacturers presented their approaches and experimental centres for various applications, and several university chairs reported on current research projects. HORIBA was also represented with presentations. Especially the talk of Dipl.-Ing. Matthias Schröder, Product Engineering Manager, HORIBA Europe, who looked into the question where the exhaust gas regulations of the future are leading us to, was perceived with great interest. During this presentation, Schröder not only outlined the changes in legislation but in a second step also reported about the challenges for emission measurement caused by increasingly low polluting vehicles.
HORIBAs expertise in the fields of measurement technologies was also demonstrated by Dipl.-Phys. Kai Lenz, Product Engineer HORIBA Europe, who presented a comparative study on the repeatability of particle counting in contrast to measurement of other exhaust gas components on basis of the New European Drive Cycle (NEDC). In this study he showed that the detection of particle number is highly reproducible when compared with NO_x and THC emissions, especially with diesel engines. Furthermore, he demonstrated that the number of particles in the test cell does not impact the measurement results.
"As a result of the great interest, HORIBA CONCEPT was a successful and trailblazing conference," Rieker emphasizes. "We are very happy to have been able to recruit numerous highly respected speakers for the event."

The Westin Bellevue Hotel Dresden turned out to be a perfect location for the event.

Perfect location

The Westin Bellevue Hotel Dresden turned out to be a perfect location for the event. Situated well within the centre of Dresden, the hotel offered a great view over the city. The exclusively equipped conference rooms with their modern technologies as well as the impressive atrium contributed to a great atmosphere which also invited to discussions at the margins of the plenary sessions.
Against this background, the whole conference turned out as a complete success. A repetition is planned as the relevancy and complexity of its topic will increase in the upcoming years.

Imprint

FSC
www.fsc.org
MIX
Paper from responsible sources
FSC® C019545

HORIBA Europe GmbH
Head Office
Hans-Mess-Str. 6
61440 Oberursel - Germany
Phone: +49 (0) 6172-1396-0
Fax: +49 (0) 6172-137385
Email: info@horiba.de
Internet: www.horiba.com

HORIBA Europe GmbH
Darmstadt Office
Landwehrstr. 55
64293 Darmstadt - Germany
Phone: +49 (0) 6151-5000-0
Fax: +49 (0) 6151-5000-3865
Email: sales.hade@eu.horiba.com
Internet: www.horiba.com

Text and Design:
TEXT-COM GmbH
Ziegelhüttenweg 4
65232 Taunusstein - Germany
Phone: +49 (0) 6128 8537-50
Fax: +49 (0) 6128 8537-59
Email: office@text-com.de
Internet: www.text-com.de

Responsible for the Content: Andy Keay