

MES for Manufacturing Excellence

Efficient production by improved processes

The MES market dynamic is unbroken. Meanwhile, MES systems are considered being a necessary tool to be able to compete as manufacturing company in the global competition. This is true, for the sublime objectives of production can really be achieved by means of an MES, for example to eliminate weak points within production, stop wastefulness, optimize processes, increase added value effectively and thus sustainably assure the global competitiveness.

Production costs does not only consist of labor costs but of material costs and process costs. Thus, efficiency is defined by cost considerations as well as transparency, quality and reactivity. And exactly these factors can be considerably enhanced by the use of MES. MES offer a real-time image of the present situation in production with the actual state of capacities, orders and qualities. So that in case of sudden disturbances, this transparency can be used to make better decisions.

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MES for Manufacturing Excellence

New ideas to increase the efficiency of production

MES-Ticker

MESA Int. and MESA Europe, New MES-guideline VDI 5600

Success Stories

HYDRA best-practices

Product News

New release HYDRA-PZE 7.2, Mobile data collection



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MPDV Mikrolab GmbH

Römerring 1, 74821 Mosbach, Germany

Fon: +49 (62 61) 92 09-0

Fax: +49 (62 61) 1 81 39

E-Mail: info@mpdv.de

Internet: www.mpdv.de

Press contact:

Nadja Neubig

E-Mail: presse@mpdv.de

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MES will soon be standard

In the near past, some important events concerning the MES market and the notion MES have taken place:

Due to the inaugural meeting of MESA Europe, the basis for the further expansion of the MES notion and the exchange of experiences and best-practices is laid. The increasing number of European MESA-members proofs the growing „popularity“ of MES in the manufacturing industry.

More important is the publishing of the VDI-guideline 5600 for MES. Therewith, the VDI (association of German engineers) developed a guideline for the users to better find the suitable MES solution in the complex MES-market. A function-oriented presentation underlines the practical-oriented view of the guideline which indicates as well improvement potentials by the use of MES. The guideline refers to the fact, that a MES should have a comprehensive range of functions to be able to support the production management of a company efficiently.

Due to the fact, that MES need to be used in real-time, the configuration of a MES is complex and oriented on the needs of the production. An implementation of MES that is based on some evaluations from the ERP-system is therewith a special solution for uncomplex and simple production types.

Measured by this guideline, HYDRA is an ideal MES. It convinces of the manifold functionalities that supports the production management as well as of the real-time use and the technology-orientation.

Prof. Dr. Jürgen Kletti
CEO and President

continuation of page 1

The detailed scheduling module of a MES reacts quickly on current breakdowns and offers new, enhanced production plans.

Due to this logic, the detailed scheduling becomes a production control. Important is, that this production control via MES takes place technology-oriented

MES offers lots of advantages

and in real-time, unlike the one-way planning scheme of

ERP-systems. A quality assurance modul guarantees during the running production process, that weak points are detected quickly to avoid scrap.

Even this short listing shows different approaches, how MES can increase the effectiveness of daily business in a manufacturing company. The data recorded by MES are of course available for process ratings. Therefore, the VDI-guideline on MES, published in 2006, and MESA Int. use the term „performance analysis“. Therewith, weak points can be detected quickly and in being aware of these, improvement measures can be derived. Thus, MES becomes an

important element of the continuous improvement process (CIP). At this point it is necessary to point out that MES allows a technology-oriented application of CIP. Due to the online respectively real-time examination of the production process, new improvement potentials arise, different to those that result from the pure consideration of commercial data or time recordings.

Of course, the use of MES has to be planned and the system has to be implemented. Therefore, it is important to be aware of targets and already known improvement potentials. A ROI-consideration even with marginal benefit will point out clearly, that an investment in MES is always profitable.

By means of the Manufacturing Scorecard, the targets for improvements can be identified and the respective target achievement can be traced permanently. With the method potential analysis, MPDV offered already in 2000 a possibility to determine the ROI of a MES. This method has been extended and

is now available as the method ROI-Analyzer. MES is not only a term for a software technology or a further round of the software industry looking for new highlights. MES offers indeed a possibility to analyse processes and to define efficient structures in using powerful functionalities.

Forum Efficient Production

In Mai 2006 over 140 managers and CEO's of leading international manufacturing companies took part in the „Forum Efficient Production“ at the congress center „Alte Mälzerei“ in Mosbach. Numerous reputable speakers from economy and science conveyed new ideas about how to survive in the global competition to the participants. Numerous attendees of the forum – among them many users of the MES HYDRA of MPDV - used this opportunity to exchange knowledge about their experiences with other entrepreneurs.

Prof. Dr. h.c. Roland Berger, founder and chairman of the board of directors of Roland



Berger Strategy Consultants, presented in his speech, which challenges the manufacturing companies have to face in the global competition. "Innovative and efficient production processes make an enormous contribution



Prof. Dr. h.c. Roland Berger

to guarantee the competitiveness of manufacturing companies worldwide.", resumes Prof. Dr. h.c. Roland Berger.

Jochen Schumacher, manager of MPDV Campus, pointed out that in many companies still exist significant wastefulnesses despite many cost reducing measures. „Most companies can sustainably increase their efficiency in reducing these wastefulnesses systematically. Instead of concentrating on the unit costs, the companies should have a closer look on the production processes what will enable them to release greater potentials.“

Furthermore, he recommended to implement process-oriented key figures.

Prof. Dr. Norbert Gronau, head of the Chair of Information Management at the University of Potsdam, showed, which economical potentials can be released by using an MES.



Prof. Dr. Norbert Gronau detected the economic potentials of MES.

Rainer Deisenroth, member of the MPDV management board, compared the production line with an airplane. „Like a pilot, companies need a „manufacturing cockpit“ for reliable information of the shop floor.“ In the following, he demonstrated the various functionalities of the HYDRA-MES Cockpit.

How such a Manufacturing Cockpit can be realized in practice, showed Dr.-Ing. Thomas Wagner, plant manager for all European production sites of TAKATA.

Due to the implementation of the MES HYDRA, the automotive supplier Takata Petri AG safeguarded his production sites by increasing the productivity of its production sites. To demonstrate the use of

MES and its benefits, Dr.-Ing. Thomas Wagner switched on to the HYDRA-server at Takata in Aschaffenburg. He showed the present status of the production in Aschaffenburg, the number of produced parts (yield / scrap), the machine status, etc. to the participants. As responsible person for all European production sites, he can get a quick overview about the present situation



Dr.-Ing. Thomas Wagner demonstrated, how Takata increased the productivity of his European plants with HYDRA-MES.

on the shop floor of each plant via mouseclick, without having to be on-site. He pointed out the importance of transparency, he gained by the implementation of MES HYDRA, to monitor, control and optimize the processes today and in the future. Furthermore, the logistic



manager Peter Bielert presented live the detailed scheduling with HYDRA.

The participants all agreed on having received new, practical-oriented ideas how to increase the productivity of the shop floor and therewith assure their global competitiveness.

Trade fairs focus on MES: Application Park shows MES in practice!

„Knowledge is power“ - this conclusion of the scientist Sir Francis Bacon from the 16th century is still valid, whereas being leading in knowledge is much more important, today, and the time to gain knowledge

Live monitoring of the order progress

is considerably shorter. The skill has always been the capability to possess the relevant information in the right quality at the right time at the right place, to be able to make the correct decisions. Referred to a manufacturing company, this would mean to realize a seamless flow of information from ERP to the machine. But many companies failed in this seemingly simple task. 13 reputable partner proved in the so-called Application Park „IT-powered Automation“ at the Hannover Messe 2007, that the integration and communication on the vertical and horizontal level can work



The Application Park „IT-powered Automation“

perfectly. Heart on IT-side was the MES HYDRA of MPDV. But is an MES system able to fulfill the numerous requirements of the complex and in most cases heterogeneous IT and production environment? We say yes and prove it at the same time. At the Application Park, we provided the opportunity to experience the versatile functions of our MES system HYDRA and its benefits live within a production environment. Besides, we demonstrated the practical use of HYDRA-MES within a complete, really producing assembly line.

ted in the laser station, tested for proper quality, packed into a cardboard box, stored in the depot and issued with an inspection certificate by presenting the individual RFID identification. The order progress could be monitored via the ID number on the terminals of the assembly line. At the MES workplace you could observe how the detailed planning is done within HYDRA shop floor scheduling. On vast screens you could get a current overview on orders and the machine status at any time.

In the Application Park you were able to order your personal coffee cup at local PCs and to monitor its production online. The cup was produced in injection molding, labeled as request-

As tie between the ERP level and the automation level, MES HYDRA is responsible for the continuous flow of information. The production orders released within SAP are downloaded to the MES HYDRA via the certified PP-PDC

Partners of the Application Park „IT-powered Automation“



interface, where they are dispatched to the single operations within the HYDRA shop floor scheduling module. Moreover, the MES acts as data hub and



provides all users of the whole company – from the controlling department to the workers – with overviews and evaluations. For this purpose, machine and process data of each machine

in the Application Park (injection molding machine, laser, inspection station, packing station, storage and robot) are automatically transferred to the MES. Having finished the order, the actual data are uploaded from HYDRA to SAP so that even the ERP benefits from the smooth data flow.

If you want to experience MES live in the production line of

IT-powered AUTOMATION
Application Park Hannover Messe 2007

HYDRA MES Produktzertifikat

Auftrag: 1000004 Artikel: mpsv
Gelegte Menge: 1 Periode: 17.04.2007

Produktionszeiten der Arbeitsgänge

Arbeitsgang	Maschine	Anmeldung	Abmeldung	Dauer
0100	AP-01-AA	17:04 19:49:43	17:04 19:49:34	0:00:48
0200	AP-02-FL	17:04 19:50:11	17:04 19:51:08	0:00:57
0300	AP-03-AP	17:04 19:51:36	17:04 19:51:59	0:00:23
0400	AP-04-PV	17:04 19:52:32	17:04 19:53:13	0:00:41
0500	AP-05-FL	17:04 19:53:41	17:04 19:54:02	0:00:21

Zeitplan im Vergleich zum Produktionsverlauf

Zeitplan: 04-MW-02

Schlüssel	Zeit	Plan	Real
Auftragslauf (HYDRA)	0:02:59	0:02:59	0:02:59
Produktion	0:02:59	0:02:59	0:02:59
Ablauf: Umkehr	0:00:00	0:00:00	0:00:00
Tacho: Störung	0:00:00	0:00:00	0:00:00
Transport: Lagerort	0:02:15	0:02:15	0:02:15
Auftragslauf	0:06:14	0:06:14	0:06:14

Prozess-Parameter aus der Produktion

Prozesswert	Einheit	Soll	Ist	Abweichung
Spritzdruck	bar	800.00	800.71	+0.71
Temperatur	°C	250.00	254.00	+4.00
Dauerzeit	sec	16.00	13.99	-1.41
Maschinenzeit	min	0.0000	4.8000	+4.8000

Ergebnis der Dichtigkeitsprüfung AXELIUS

Druck: 04.74 mbar

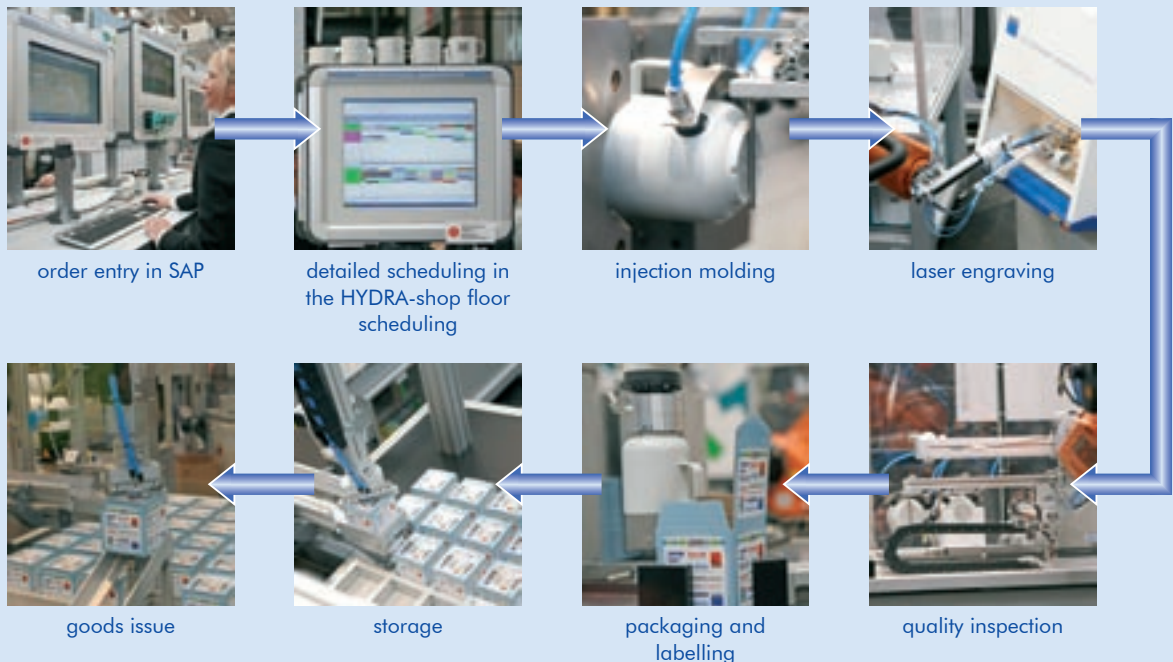
Produziert by HYDRA MES 17.04.2007 19:52



the Application Park again, you will have the possibility at the ICC Industrial Communication Congress of Phoenix Contact,

which will take place on 04. - 05.09.2007 in Blomberg. Further information can be requested at info@mpdv.de.

The Process Chain



New VDI guideline for MES

In 2004, VDI (association of German engineers) founded a working group that should define the MES notion in more detail. Under the direction of the appointed chairman Dr. Jürgen Kletti, approx. 90 users,

VDI guideline defines eight central MES tasks

manufacturers and system integrators have gathered in order to prevent the MES notion from being diluted. The VDI has developed a guideline 5600 on MES, based on the tasks and benefits of MES-systems. Eight tasks have been defined, which have to be fulfilled by a MES to support the production management: detailed planning and control,

management of resources, material and personnel, data collection, performance analysis, quality management and information management. Each task is described by means of a structure diagram, the required input information and functions. A matrix states, which company processes are supported by the respective tasks and which benefits can be achieved. It has been defined, that the time horizon of MES functions last from several seconds to a complete shift – thus an MES has to be capable to run in real-time. A MES records complex data manually and automatically, evaluates them in real-time, shows consequences and suggests alternatives.

The MES-functions include the whole range of tasks of production



managers. A MES should have a minimum of complexity and functionality comprising some of these functions. Therefore, a simple SDC (shop floor data collection) or MDC (machine data collection) can hardly be considered as MES. According to this regulation, HYDRA can be regarded as an ideal MES, providing extensive functions for the tasks described. The functions of the performance analysis are efficiently covered by the Manufacturing Scorecard. Many HYDRA users actually profit from the benefits identified in this VDI guideline.

Inaugural meeting of MESA Europe

MESA International is a non-profit organization that has been promoting the MES idea mainly in the USA since the middle of the nineties. The MESA function

model has become a synonym for an application-oriented IT description. By installing an International Expansion Committee and appointing a first European board member, MESA started an international approach. MESA Europe was founded as first subsidiary organization that should represent MESA International in Europe. Along the lines of the American model, the dialog between MES users and providers is supported via exchanges of experiences, conferences and conventions. Collaborations such as with the VDI (association of German engineers) MES working groups are supposed to help synchronizing international and regional standardization efforts. Dr. Jürgen Kletti has been appointed chairman of MESA Europe, vice chairman is Jan Snoeij of LogicaCMG. Today, MESA has already more than 60 European members.



model has become a synonym for an application-oriented IT description. By installing an International Expansion Committee and appointing a first European board member, MESA started an international approach. MESA Europe was founded as first subsidiary organization that should represent MESA International in Europe.



The present chairmen of MESA Europe (from right to left): Dr. Jürgen Kletti, Michael Schwarz, Jan Snoeij and Rainer Glatz (VDMA)

To push MES in Europe, MESA plans several events and conferences in the near future.

MESA P2E-Conference and MESA Europe

MES market holds large potentials

In October 2006, 250 users and system providers met for the four day MESA International Conference in Orlando, Florida.

Themed P2E (Plant to Enterprise), integration scenarios between

production and company management were presented in many specialized lectures. Prospective benefits that can be

achieved with a MES system were described in particular. Detailed analyses have shown that in many areas, the integration process between production and ERP has only started and that huge potential slumbers in the MES market. A potential which the globalization

chances of industrialized countries finally benefit from. When it came to the elections of the board, Prof. Dr. Jürgen Kletti has been affirmed as chairman of MESA International and MESA Europe.

In the meantime, the board of MESA Europe has been extended to five members. Three other members are still

planned to join the board. By the activities of MESA International and MESA Europe MPDV has again documented its pioneering task in the MES issue in Europe.



Prof. Dr. Jürgen Kletti, chairman of MESA Europe, and Matt Bauer, chairman MESA International, at the P2E conference in Orlando.

MESA Europe starts its first activities within the European environment. Therefore, an MES conference took place on 28 March 2007 together with VDI (association of German engineers).

Honorary professorship for Dr.-Ing Jürgen Kletti



On April 25th, 2007 Dr.-Ing. Jürgen Kletti, owner and managing director of MPDV Mikrolab GmbH, was awarded the honorary professorship of Baden-Württemberg, initiated by the University of Cooperative Education Mosbach. Many guests from politics, economy and science as well as

MPDV clients participated in the event. Dr. Wenner from the Ministry for Art and Science presented the award and recognized Jürgen Kletti's excellent achievements and contributions within the area of education, technology and science. Within the scope of this commitment, Prof. Dr.-Ing. Jürgen Kletti has been lecturing about the topics

company management and company strategy at the University for several years. Moreover, he has gained a good reputation as bestseller author of four books, which were released by the reputable publishing houses Gabler and Springer, and editor of numerous publications. Last but not least his successful, entrepreneurial activities as CEO of MPDV have decisively contributed to the attractiveness of the business location Mosbach.

Prof. Dr. Gronau, holder of the Chair for Commercial Information Technology and Electronic Government at the University Potsdam, held the honorific speech. He recognized Prof. Dr.-Ing. Jürgen Kletti by emphasizing his outstanding achievements with respect to the MES issue. One of Kletti's concerns

was to provide for more transparency and efficiency in production companies by means of MES and thus to help securing the economic future of the respective location. Prof. Dr.-Ing. Kletti concentrated himself above all to the development of the MES notion and the MES market. Due to his leading functions in well-known industry organizations such VDI, VDMA or MESA, he could promote the MES issue throughout the world.

Prof. Dr.-Ing. Jürgen Kletti has been awarded the honorary professorship as he is a man who has enriched engineering technology like hardly anyone before him by his exemplary and sedulous commitment in education, science and economy.

MPDV goes East: Focusing Eastern Europe

The Eastern EU enlargement is an essential promoter for MPDV's international growth. With more than 25 successful implementations in the Czech Republic,

MPDV develops its worldwide presence

Slovakia, Poland, Slovenia, Romania, Hungary and Russia, the foundation has been laid for becoming an international MES provider. Due to the reduction of administrative barriers and the increased acceptance / introduction of the Euro in Eastern Europe, strong growth markets opened up for MPDV, whose meaning will increase in the next years.

In the nineties, the labor costs factor of Eastern Europe was the primary motivation for Western European manufacturing companies. Decisions on where the production sites should be located were mainly made on the basis of the "pure hourly wage". Meanwhile, a change in thinking has taken place.

On the one hand, it has been recognized that wages will also increase rapidly in Eastern Europe and on the other hand, that added value lies in process efficiency.

HYDRA users also have to face the challenges of globalization. Many MPDV clients have opened new plants worldwide, particularly in Eastern Europe. However, as the general conditions have aggravated there as well, more and more users decide to roll out HYDRA to their foreign production sites to produce more efficiently, e.g. tyco electronics, Takata, Swisscaps, Hoppe, ept, Knorr-Bremse, Semmelrock, Gleich and Gedia. To provide the users with the best possible support during their global roll-outs, MPDV collaborates with local partners.

Examples for successful partnerships in Eastern Europe:

In October 2006, the first joint seminar took place in Slovenia where more than 40 participants gathered information on the benefits of MES.

INDUSOFT

Indusoft (www.indusoft.ru) based in Moscow, Russia.

At the INTERPLASTIKA 2007, MPDV presented together with Indusoft HYDRA's possible fields of application within the plastics industry. MPDV as well as the HYDRA users benefit from the partner network in



Numerous participants gathered information at the seminar "Added value without dissipation" by Robotina and MPDV in Slovenia.



Robotina (www.robotina.si)

with its head office in Koper, Slovenia. The cooperation has already borne fruits – five Slovenian companies are using HYDRA-MES successfully in their productions: DOMEL, GORENJE, ODEJA, ADK and SKRL.

Eastern Europe. Besides other partners in Far East – see report about in the next issue of NEWS – MPDV provides an international partner network that is constantly being extended. An "international working group" based on the HYDRA USERS GROUP will certainly be established by the users.

Book report: MES – Manufacturing Execution System

In 2005, the MPDV-bestseller „MES – Manufacturing Execution System“ was published by the reputable company Springer. It was that successful, that Springer decided to publish an English

New MPDV reference book: All about MES

version of the best-seller, which was finally presented in May 2007. Prof. Dr.-Ing. Jürgen Kletti's (ed.) book shows, how a MES system as "modern information technology can contribute to the process capability of the added value."

The content of the book: Process capability is the result of modern information technology. Today, IT mainly means telecommunication and business software. So far, business processes have been described and optimized with focus on its use within the commercial sector, applications for production planners and product design at industrial companies.

Managerial problems, which many companies are still not prepared for, result from the change of the classic factory from a production plant to a modern service

center: economic efficiency of modern added value is not a property of the products but of the processes. This leads to the fact that decisive company potentials do

not derive from their manufacturing capability but rather from process capability. Along with a basic introduction into the subject, technical essays describe the requirements of a Manufacturing Execution System (MES). The reader gets a comprehensive idea of the efficiency and the possible fields of application of such systems.



The index as well as a free trial chapter can be downloaded from

the Springer website:

www.springeronline.com

If you are interested in the book, you can directly order it at MPDV (campus@mpdv.de) or at Springer.

Springer Verlag Heidelberg 2007, ISBN 978-3-540-49743-1 at a price of EUR 74,85 (english edition).

Springer Verlag Heidelberg 2006, ISBN 978-3-540-28010-1 at a price of EUR 49,95 (german edition).

Further publications of MPDV in german language



Prof. Dr.-Ing. Jürgen Kletti

Konzeption und Einführung von MES-Systemen

Zielorientierte Einführungsstrategie mit Wirtschaftlichkeitsbetrachtungen, Fallbeispielen und Checklisten

Springer Verlag Berlin / Heidelberg 2007

ISBN 978-3-540-34309-7, EUR 59,90



Prof. Dr.-Ing. Jürgen Kletti, Dipl.-Kfm. Otto Brauckmann

Manufacturing Scorecard

Prozesse effizienter gestalten, mehr Kundennähe erreichen

Gabler Verlag Wiesbaden 2004

ISBN 978-3-409-12582-6, EUR 39,90

Achieving FDA conformity with HYDRA

HYDRA-MES: conforms to FDA CFR 21 Part 11

To be able to sell products from the food and drug sector in the USA, the manufacturing plants have to meet the requirements of the US authority Food and Drug Administration (FDA). FDA is an American authority that is responsible for patient safety and consumer safety within the industry sectors medical engineering, pharmaceuticals and food. Thus, also European companies have to fulfill the FDA requirements if they want to deliver their finished products to the USA.

FDA-compliant means, that the software meets defined, functional requirements and that it works reliably enough to keep the risks for patients or consumers in justifiable limits. In many cases, FDA demands, that the software used within production or quality management is validated.

The manufacturing requirements are regulated in the GAMP 4 process model (The Good Automated Manufacturing Practice). Furthermore, FDA makes additional technical demands on automated systems that generate and retain required records electronically. These rules are regulated in a document known as CFR 21 Part 11. The MES HYDRA meets the technical requirements regarding the system of CFR 21 Part 11.

These requirements basically are:

Access security:

Authorization concept, password rules, cryptic password encoding

Audit trails:

Logging of all system transactions via HYDRA MES-Weaver, logging of all messages/changes of raw data, review options, protection against access and manipulation

Data consistency:

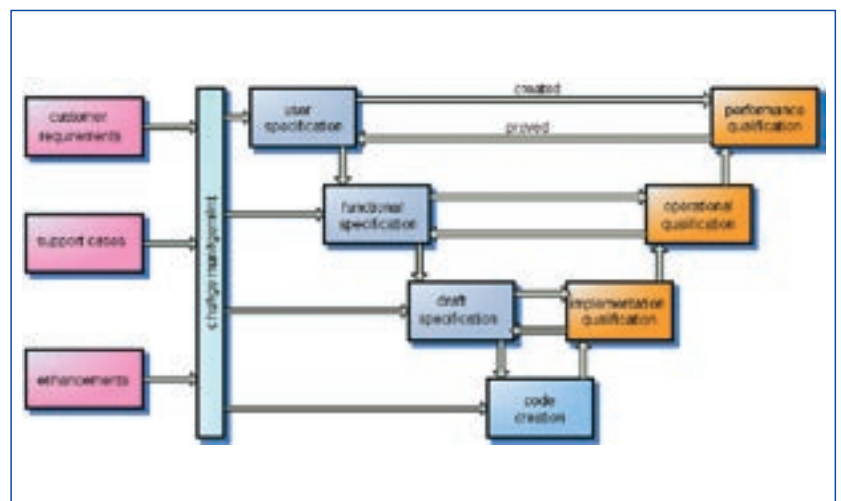
Plausibility check, input support via selection lists, display of plausibility violations with explanation, logging/alarm of critical events via the HYDRA escalation management

Identification of persons:

Electronic signature, identification of persons through media that can be read electronically (barcode, legic, biometric scanner).



The lifecycle of the HYDRA software is subject to the V-model of GAMP 4 at MPDV and thus fulfills the basis for validation when it is used within a customer system. The evidence that the MPDV quality assurance system works has already been proved by passing successfully customer audits, for example by Swiss Caps AG. Moreover, MPDV supports its customers, e.g. when it comes to the creation of a risk analysis to get an overall system conformity by FDA.



Lifecycle management of the HYDRA software according to the GAMP V-model

New release HYDRA-PZE 7.2

HYDRA-PZE 7.2: more flexibility within HR

Having completed the new HYDRA release 7.2 for shop floor scheduling and production data collection, the new release of

the HYDRA time and attendance module, HYDRA-PZE 7.2, is now available. Due to

many new functions and extensions, the users now benefit from a considerably enhanced time and attendance module.

Employees working in human resources can now dispose of many new options to generate individual lists and evaluations. Thus, along with the selection criteria "company", "area" and "cost center" almost 40 fields from the HR master can be included in individual selections. Due to a multitude of additional fields that can be assigned individually within the HR master, the users are very flexible and can generate respective lists or evaluations for each issue at the push of a button.

Key figures also play an increasingly important role within HR. Via the "work day statistics" function, HYDRA-PZE for example,



HYDRA-PZE 7.2 provides many options to determine and display key figures within the personnel area.

provides the possibility to determine individual personnel key figures. The user has the option to have the key figures displayed as evaluation and as trend in lists and graphics. This may concern e.g. key figures on absences, status of employee's illness or working time trends. If required, the data can further be summarized according to the criteria defined in the HR master or date fields.

Another highlight of the new release is the HR master that can now be managed in versions. Thus, several "versions" of a person can be defined with different validity periods. In this way, e.g. cost center changes can be planned in advance. The following list shows a selection of other, new functions of the latest release:

- Leave and shift planning: in the personnel scheduling

and absence overview function absences can directly be planned via the context menu while determining the shift sequence at the same time.

- Mass entry for clockings: one clocking can be created simultaneously for several employees, e.g. in case of a works meeting.
- Working time and remuneration models: Weekly models and period models can easily be used to represent cyclically repeating models. Annual models are useful for flexible models that have no fixed rhythm.
- Visualization of the employees' next absence that has already been planned in the attendance and absence overview.

The screenshot shows a personnel list table with columns for 'Person', 'Status', 'Absence', 'Date from', 'Date to', 'Status', 'Working', and 'Cost'. The table contains several rows of data, including employee names and their corresponding status and absence information. The interface also shows a sidebar with various menu options and a top navigation bar.

HYDRA-designer for labels and shop floor papers

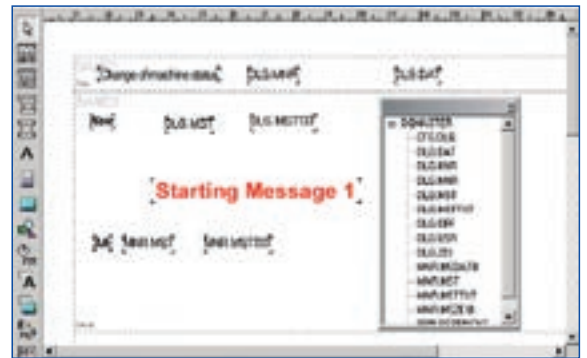
For the most diversified reasons, many companies need to create individually designed production documents such as labels, time tickets, material certificates

Easy creation of individual labels

or container documents. The effort for designing, managing and printing such labels and documents is complex and causes increased costs. With HYDRA-ETD, MPDV offers an efficient tool by means of which individual labels and shop floor papers can quickly and easily be designed and created. The design tool is integrated in HYDRA and therefore it is able to retrieve the required

data from the local shop floor terminal as well as directly from the central HYDRA database.

The HYDRA label designer provides a user-friendly graphical tool to design labels individually. Thus, users can configure the labels individually according to their special requirements. For this purpose, they can use any kind of information such as text, barcode or pictures. Besides managing and designing labels, the users are also in the position



The HYDRA-ETD module provides the users with versatile options to design easily individual labels.

to define in advance, which labels are to be printed at what terminal. At the same time, it is possible to trigger the printout of different forms in the user dialog.

New machine interfaces in HYDRA

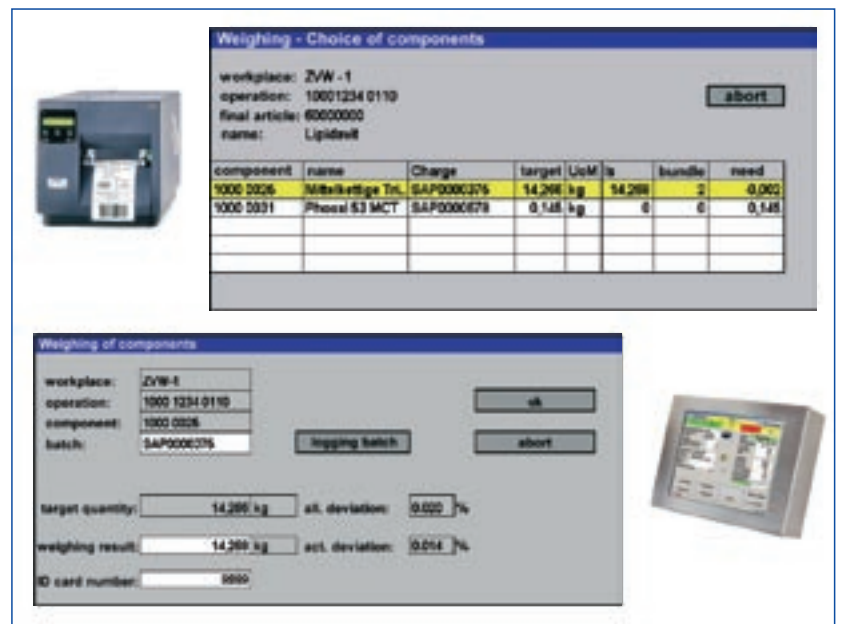
The HYDRA Process Communication Controller (HYD-PCC) has been extended by further new interfaces for a direct data

HYDRA offers numerous interfaces

exchange between machine/system controls and the HYDRA applications.

On the basis of the new platform HYDRA MES-Weaver 2.0, further new machine interfaces are available:

- Measuring machines of the HOMMEL OPTICLINE product line
- Arburg injection molding machines with Selogica controls
- Injection molding machines of the Swiss company Netstal on the basis of Euromap 15
- Multi-stage assembly lines for



An example of terminal dialogs to establish an FDA-compliant collection logic in HYDRA.

- braking systems on the basis of OPC
- Spinner machine tools with Sinumerik 840D controls
- Universal CNC lathes by

- Gildemeister with Heidenhain controls
- MAHO revolver lathes with Philips controls and Takisawa TT-200 with Fanuc controls

Mobile data collection with HYDRA

In addition to the common, fixed terminals, MPDV provides the users with the option to col-

Prompt and mobile: data collection with MES HYDRA

lect data in a mobile way by means of light, handy and portable devices such as handhelds, PDAs, scanner terminals based on Windows CE or similar devices. Thus, the workers can use the terminal functions of the MES HYDRA from any location and at any time. According to the respective requirements, the user can collect the data manually via buttons, touchpad or virtual keyboard of the shop floor devices or automatically, e.g. with an integrated barcode reader.

Normally, the communication is effected online via Wireless LAN (WLAN). Thus, data are constantly exchanged and synchronized between the HYDRA database and the mobile shop floor devices. When it comes to

outdoor jobs or work in areas without WLAN the offline capability of the data collection devices bridges the time and enables a continuous data collection. During the offline phase, the data are buffered in the mobile device and matched with the HYDRA database as soon as they are synchronized at a docking station or when the WLAN radio network is again available.

Mobile data collection can be used for nearly all HYDRA modules and thus provides comfortable functions. Some examples are: collection of order data, logging orders or operations on and off, recording of machine statuses, disturbance reasons, yield, scrap quantities and scrap reasons, change of partitioning, display of persons logged on to a machine, collection of resource statuses including storage location and measures, collection of CAQ measured values of characteristics defined in advance for inspection orders and documentation of detected defects, online display or processing of (escalation) messages.

The user can view the current machine conditions in the status bar. Moreover, there is a fast access to the most important functions. The radio transmission guarantees, that all data are promptly available for other evaluations and analyses within the MES HYDRA, so that foremen, plant managers, work



schedulers or production schedulers always have an overview about the current situation in production.

Mobile data collection is especially suitable to be used at vast production lines with long distances to fixed terminals, or in case of time-critical production processes, when flexibility is asked and mobility plays an important role. Due to reduced distances and input times, the user's work is considerably simplified and accelerated as well as potential sources of errors are avoided. Consequently, mobile data collection represents another step towards more transparency and an increase of added value within production.



RFID – hype or blessing?

Economic efficiency by using RFID within production

Efficient use of RFID within production

Sensor and RFID technologies are about to change strongly value added processes and logistic processes within production and trading. In order to be able to tap the full potential of these technologies, it is indispensable to analyze their adaptability and benefit. The technology provides many interesting possibilities.

In order to “determine” economic efficiency of RFID within production, its benefit has to be analyzed at first for each individual case. To check the possible fields of application within the production and the economic efficiency of its usage, MPDV has participated in a research study of the Humboldt University in Berlin and SAP AG.

Under the direction of Prof. Dr. Oliver Günther and on behalf of SAP AG, the institute for commercial information techno-

logy of the Humboldt University in Berlin analyzes options to integrate RFID and other smart item technologies efficiently into company data processing. Central questions concern the selection of an appropriate IT architecture for a given industry sector or production structure and the tasks as well as the analysis of the economic efficiency of a selected solution. In collaboration with MPDV Mikrolab GmbH it was exemplarily checked with some selected HYDRA users, under which circumstances it is reasonable to use RFID and other sensor technologies within the production in view of economic aspects. Attention was especially turned to the data volume that may probably appear and the data flows to be expected, transferred via the MES (Manufacturing Execution System) to the ERP system.

Taking the involved HYDRA users as example, the aim was, to show how existing IT architectures have to be modified in order to guarantee that RFID technology can be used efficiently and which economic benefits result from using RFID technology compared to conventional technologies such as barcode. The principal task was to determine the return-on-investment as precisely as possible.

The initiators for the study:



The HYDRA users participating in the study:



At first, an as-is analysis was performed and a rough-cut planning for a possible application of RFID was developed as well as the data generated via RFID were integrated into the corporate IT structure. A plant visit as well as several discussions with employees from different management levels of the partner company constituted the basis for the as-is analysis.

The results of this first stage were prepared in terms of a confidential study for the partner companies. With their agreement, a shortened and



anonymous version of this research will be prepared as case study and used for academic purposes by the Humboldt university. Moreover, HYDRA users can dispose of these case studies that can be obtained via MPDV.

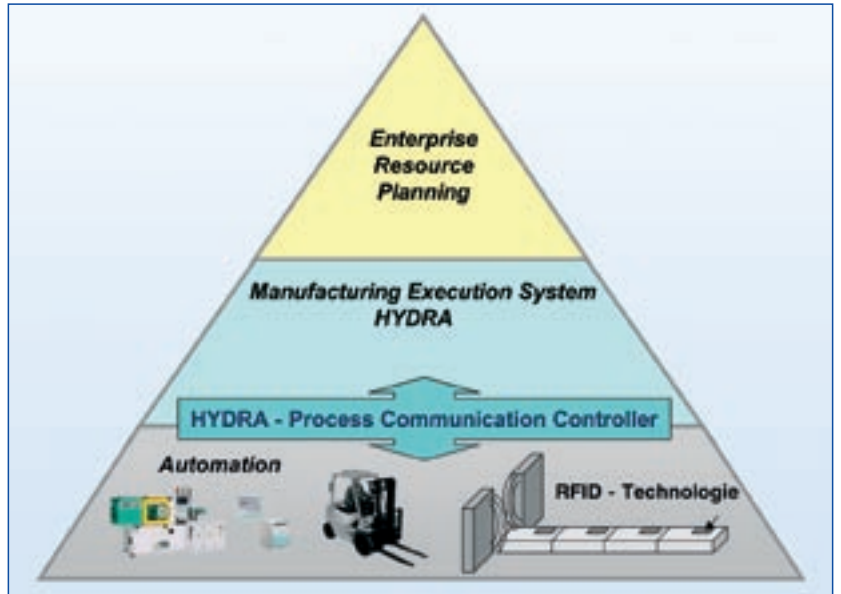
The broad range of analyzed applications from different industry sectors and production structures in connection with the specific goals that are strived for by the single companies when using RFID is also

Manifold RFID applications

very interesting. A publication of the case studies and the elaborated results,

which will be created in cooperation with the Humboldt University, SAP AG and MPDV Mikrolab GmbH, is currently being planned.

From the current status of research, the following intermediate conclusion can be made: RFID chips are in the position to save real-time data from the production process. The current order data (order, article, quantity, dates, actual and target processing times, downtimes, disturbances, etc.) as well as batch information such as the resources used (manufacturing resources, material, personnel), process data and quality data, for example, belong to this kind of data. In order to be able to use RFID data and sensor data within the value added processes they have promptly to be processed, aggregated, filtered



Within HYDRA, the Process Communication Controller (HYDRA-PCC), which has so far been installed many times in connection with the HYDRA MES-Weaver, guarantees the complete integration of the RFID technology. This HYDRA component is the most important bond between the automation level and the HYDRA MES functions.

and transferred to ERP systems such as SAP-R/3 via available MES systems such as HYDRA by MPDV. This fact can be explained very well in the above IT company pyramid, which is also included in similar form in the study.

If you are interested in the research please contact: Wolfhard Kletti campus@mpdv.de

Excerpt from the case studies: the users' objectives

- Reduction of manual input (scanning barcodes)
- Data collection on difficult environmental conditions (e.g. paint shop)
- Acceleration of placement in storage and removal from storage
- Reduction of shop floor papers and labels
- Synchronization of production processes: data transport via RFID
- Intermediate storage of process data
- Container management
- Standardization of labels
- Automation of material movements and inventories
- Improving process analysis
- Support of customers' specifications (use of customer RFID chips)
- Automatic monitoring of material
- Automatic verification of materials within the production process
- Monitoring of coils
- Support of emergency systems, e.g. in case of network failures

Cititech Industrial Engineering Pte Ltd

www.cititech.com.sg



HYDRA-Success Story

The Singapore-based company CITITECH Industrial Engineering Pte Ltd was founded in 1994 as a processor for cutting and shaping sheet metal with a workforce of five employees. As of 2006, the complete workforce has grown to almost 50 employees in total, having their manufacturing facilities located in Jurong Industrial Estate in the West of Singapore and being a one-stop manufacturing center for manual and CNC-based laser cutting, bending, turret punching, turning, milling, welding and assembly. Being a contract manufacturer, CITITECH mainly receives individual orders for a high variety of goods to be produced and transformed for their clients. On top of that, an own range of product designs is available, such as playground utilities, park benches and casino tables.

While the technical engineering and planning department was already equipped with state-of-the-art Ethernet-based CAD and DNC-systems, the complete shop floor environment was being planned and monitored in a complete manual manner, including a lot of staff effort and spread sheets. It was the company management's strategic intention to introduce an integra-

ted and transparent IT-system for

- improved shop floor planning (order sequencing),
- shop floor performance evaluation and
- online tracking of production orders along the shop floor.

A classic business-oriented ERP-system was considered to be not the right fit at the current time, as it could not provide the detailed process-oriented KPI's for shop floor evaluation and could not closely integrate the planning / control center with the actual shop floor performance. As a result, CITITECH chose the MES HYDRA with two of its standard modules shop floor data collection (SDC) and machine data collection (MDC).

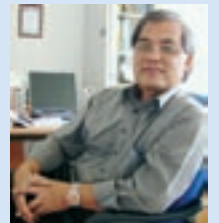
HYDRA was installed in cooperation with MPDV's strategic Asian partner SYTEC PTD LTD in an overall time frame of only two weeks before Go-Live. The complete production scenario at CITITECH was simply translated into pre-defined work plans (production order templates) within the HYDRA planning landscape. The result was a considerable reduction of necessary planning spread sheets and the immediate online connection of the current order plan to the HYDRA shop floor terminals. Operators can now retrieve their "To-Do's"

from the order sequencing list at each of the six shop floor terminals and provide simple and swift feedback with regards to start, end or interruption of an operation, production yield and scrap respectively scrap reasons as well as all incurred resource statuses during the order progress.

Future interest at CITITECH in the course of 2007 will be the direct machine connection of existing and newly-procured state-of-the-art laser machines and existing turret punching machines, to achieve higher data consistency from the shop floor.

**Mr. Siew Yit Foong,
Managing Director:**

"We are now able to immediately view our machines' current statuses and to pull out a report about our performance history – just with the click of a mouse."



**Mr. Tay Thiam Lye,
Planner and Project Manager:**

"Upon receiving our customers' project order, we can immediately translate it into the corresponding production orders in HYDRA, simply by utilizing the pre-defined work plans. Our shop floor planners can then sequence each single operation for each single machine or work place – just by drag and drop, and with almost no paper involved."



Takata Petri AG

www.takata.de



HYDRA-Success Story

In 2000, the Petri AG which was founded by Richard Petri in 1899, merged with the Takata Corporation (Tokyo). This was the beginning of the Takata Petri AG, that belongs to the worldwide leading developers and manufacturers of integrated passenger protection systems with more than 33,000 employees at 23 production sites. The product portfolio ranges from steering wheels, airbags, inflator assemblies, seat belts, interior panels, child safety seats to electronics and sensor systems. As automotive supplier, Takata is convincing due to its customer-specific solutions, technological advance as well as its high demands on service and quality.

The controlling department was the first that asked for a Manufacturing Execution System (MES). They recognized, that the real actual costs could be determined per article by means of an MES and therefore a more precise final costing as well as a fast identification of profit earners

and deficit makers would be possible. Today, Takata uses the following HYDRA modules: shop floor data collection, machine data collection, material and production logistics, shop floor scheduling as well as tool and resource management. Furthermore, the employees of Takata generate company-specific reports and evaluations via the development environment HYDRA-applications.

One HYDRA highlight is the visualization of the machinery within the factory. The conditions of all machines are shown in realtime on a large



screen. The employees are immediately able to identify the cause of a disturbance and the location of the insufficiently working machine. At the same time, an automatic alarm message is sent by sms or e-mail via the HYDRA escalation management tool to the person in charge, who is immediately

in the position to remove the problem. Thus, downtimes have been minimized and process security has been increased considerably at Takata. By means of the HYDRA module material and production logistics, Takata performs the traceability over all processes. The module HYDRA shop floor scheduling controls the detailed scheduling, taking the availability of tools and resources into account. Everywhere in the world, the production manager can log on to the MES HYDRA and can get an overview about the current situation within the production. Takata permanently extends its MES HYDRA. Consequently, other HYDRA modules such as process data collection and incentive pay have been implemented in the meantime and it is planned to implement the CAQ module as well. Today, the MES HYDRA is used in the Takata plants in Germany, Poland, Romania and the Czech Republic. The roll-out to the other European sites has already been scheduled.



**Dr. Thomas Wagner,
Director Center of Competence Airbag & Electronic Systems:**

“By installing HYDRA-MES, we have increased our productivity by 10 to 20% at an ROI under two years. HYDRA provides us with the functions that we need to be able to monitor, control and to keep optimizing our production.”

Böhler Bleche GmbH

www.bohler-bleche.at



HYDRA-Success Story

BÖHLER BLECHE is a worldwide leading manufacturer of cross-rolled stainless steel sheets and plates. The company looks back on a success story of more than 140 years. High-quality sheets, plates and blanks in tool steel, high-speed steel and material for aviation as well as stainless specialties and press plates are produced at the site in Mürzzuschlag (Styria/Austria). BÖHLER BLECHE is specialized in products that meet the most stringent demands for precision, uniformity and mechanic-technological as well as physical properties.

BÖHLER BLECHE products are used, among other things, for the production of buzz saw blades and machine blades, die cutting tools and technical lamination in industrial furnace and turbine manufacturing as well as to manufacture printed circuit boards and paper board containers. Every production step from melting to the delivery is subject to a strict quality management according to DIN EN ISO 9001:2000. The required

metallurgical and mechanic-technological values are directly checked for each production batch.

The inhomogeneous system environment of BÖHLER BLECHE within the production planning and control environment should be replaced by a modern, integrated IT solution. After a testing phase, the successful go live took place at the beginning of 2005. The SAP consulting agency INTESY was responsible for mapping the production processes and control processes in R/3.

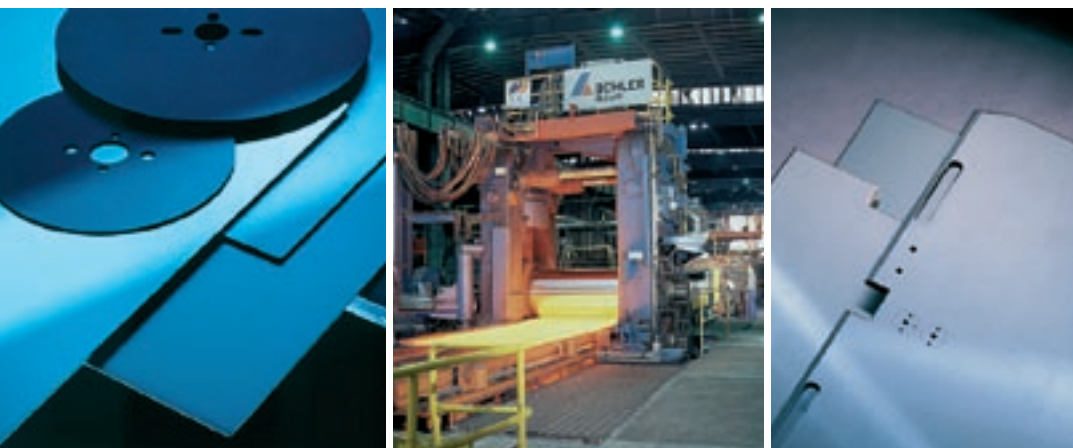
A continuous logistical application, providing precise information on the work in progress within production has been established by a tight connection to the HYDRA MES system. Besides production data and process data, the conditions of the single aggregates (roll stands, straighteners, cutting lines and testing machines) are also recorded in real-time. Therefore, downtimes and problems are recognized imme-

diately and can be forwarded to the maintenance at an early stage in order to have them solved. Thus, an optimum load factor is guaranteed. By comparing the actual period of use with the target standard time, HYDRA determines the performance efficiency rate for each workstation. Effective production costs can be determined and uploaded on the basis of the actual machine-tool efficiency, which enables an exact costing.

Moreover, HYDRA provides data to optimize semi-finished products and to calculate basic data as well as to generate work plans and to compute average costs. Furthermore, BÖHLER BLECHE uses the integrated time and attendance module HYDRA-TA. Along with attendance times, the machine efficiency rate, determined within the machine data collection (MDC) tool of HYDRA, constitutes the basis for a performance-related remuneration.

**Ing. Gottfried Engelbogen,
Logistics manager at
BÖHLER- BLECHE GmbH:**

"The aim of a homogeneous system environment could be achieved due to the efficient collaboration of all experts starting from the application to the realization by INTESY and MPDV. By means of an optimum combination of SAP and HYDRA, the quality of information has been considerably improved."



+++ Project-Ticker +++ Project-Ticker +++ Project-Ticker +++

A choice of international operating companies, that currently decided to implement HYDRA:

After the successful implementation of HYDRA-MES in the production site in Belgium, Italy, the Czech Republic and Switzerland, **tyco electronics** decided to roll-out HYDRA to the German site in Speyer. In future, the HYDRA-modules SDC, MDC, TRM, DNC, PDC/SPC will be used in injection moulding.

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Since more than 100 years, **Knorr-Bremse** produces braking systems for utility vehicles. With 12.000 employees, the company is today a leading international automotive supplier. The production site in Aldersbach uses the HYDRA-modules SDC, MDC, MPL, SPC, PDC and DNC. It is planned, to roll-out HYDRA to all sites around the world. At the moment, the implementation in Hungary takes place.

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With 13.000 employees, the Brazilian company **Villares Metals** is the biggest steel producer in Latin America. In Sumaré, Villares benefits from the use of the HYDRA-modules SDC, MDC, MPL as well as CAQ.

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SWISS CAPS earns the reputation of being a leading international manufacturer of pharmaceuticals, health care products and cosmetics. Thanks to MPDV, Swiss Caps was successfully FDA-certified, so that the production sites in Bad Aibling, Kirchberg and in Cornu/Romania use the HYDRA-modules SDC, MDC, SFS, Time and Attendance, ACS and TRM.

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From the benefits of the HYDRA-modules SDC, MDC, SFS, MPL, CAQ and ESC also profit the sites of **KAMAX-Werke Rudolf Keller-mann GmbH & Co. KG** in Germany, Slovakia, Spain and the Czech Republic. It is planned, to roll-out the MES to further production sites in Germany and in the USA. With more than 2.400 employees worldwide, Kamax develops and produces engine fasteners, wheel bolts and wheels studs for the automotive industry.

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With more than 8.000 employees worldwide, **Phoenix Contact** is one of the leading manufacturers of the industrial connection technology, automation technology, electronic interface systems and surge protection. Phoenix Contact uses in his production sites in Germany and Poland the HYDRA-modules SDC, MDC, SFS, PDC, DNC and TRM.

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In six production sites, thereof four in Tunisia and two in Germany, the manufacturer of ferrites, coilformers and inductive components, **Kaschke KG**, with solely 1.100 employees in Tunisia, uses the HYDRA-modules SDC as well as Time & Attendance.

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Being manufacturer of plastic products used in the medical, cosmetical and chemical industry, the Israelian producer **DANOR** made a name for himself beyond regional borders. As first implementation of HYDRA in Israel, the modules SDC and MDC are successfully in use.

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The **Wilden AG**, located in Regensburg, is part of the Gerresheim group and one of the biggest plastic processors in Europe. It produces technical and medical plastic systems. In total, eight production sites in Germany, Switzerland, the USA and the Czech Republic, Wilden uses the HYDRA-modules SDC, MDC, SFS, CAQ, TRM, MPL, DNC, PDC, ESC and the development tools HYDRA-applications to assure its FDA-conformity.

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With more than 16.000 employees worldwide, the **Mondi Packaging** group is a leading manufacturer of papers and packaging solutions. The HYDRA-modules SDC, MDC, PDC and MPL for coil-based manufacturing are implemented at the North-American sites in Menasha, Wisconsin, Lancaster and Ohio of Mondi Packaging Akrosil, LLC. Besides, further installations within the Mondi group in Heerlem, The Netherlands and Steti, Czech Republic exist.

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Besides the German site in Boppard, the manufacturer of machines for the compaction of soils, asphalt and refuse as well as stabilizers/recyclers, **FAYAT BOMAG** benefits from the HYDRA-modules SDC, MDC, MPL, Time & Attendance, ICP and ACS in two production sites in the USA.

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Tarkett produces various floorings in using the HYDRA-modules SDC, MDC and MPL, at its sites in Sweden, France and Luxembourg. Roll-outs to Great-Britain and the USA are planned.

The HYDRA Users Group

After having reorganized the HYDRA USERS GROUP (HUG) in 2004, more and more users of the MES HYDRA joined the organization. Today, already more than 100 customers are

**From users
for users**

HUG-members and thus profit from the various benefits: access to a broad network of users and MES-experts, exchange best-practice tips, developing solutions for special tasks and influence the further development of HYDRA.

each conducted by a group manager and his representative. Besides, there are mentors from MPDV for general, organizational HUG-belongings as well as for each working group, supporting the HUG-activities on the functional side.

Once in a year, the HUG invites all HYDRA users to the annual HUG-meeting in Mosbach.

According to the motto „from users for users“, the program contains practical oriented information like best-practice lectures, workshops on brand-new topics, current information about

new functions of HYDRA-MES, reviews about the current work and results from the working groups and many possibilities to exchange experiences with other HYDRA users. The meeting is accompanied by an in-house exhibition providing the possibility to gain information about contiguous themes like terminals, IPCs, server systems or RFID. The feedback of the



HUG members and participants is overwhelming: „You meet here over one hundred contact persons for one issue that you



The HYDRA Users Group is an autonomous organisation of HYDRA users that is managed by an advisory board consisting of a chairman (Günther Börner, HP)

and his representatives (Herbert Hajek, Oechsler and Thomas Andres, Otto Bock) as well as four working groups for the areas production, human resources, quality and IT / strategy



normally have to deal alone with.“, said an enthusiastic attendee of the last HUG-meeting. Beyond the annual HUG-meeting, each working group meets several times a year – host is always another HYDRA user of the working group – to discuss present topics, new functionalities and to provide best-practice know-how by a factory tour.



To offer HUG-members with less time for an active participation in the HUG working groups nevertheless the possibility for a collaboration, the HUG launched its own website in 2006: www.hydra-usersgroup.com ! „Everyone is now able to collaborate – even from our desks.

www.hydra-usersgroup.com

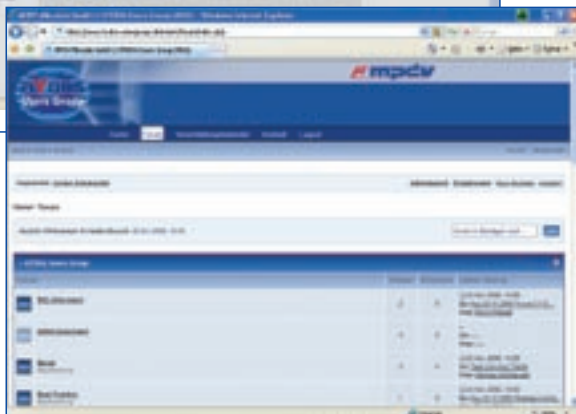
We hope, that the new HUG internet forum will motivate further HYDRA users to engage in the HUG, so that we can carry on with our intense and efficient work in our working groups.“, comments HUG-chairman Günther Börner. The HUG-website offers information about the organisation and



HUG-member list, newsletter, download area and forum. In this way, the exchange of experiences and information in the areas best-practice, system and strategic should be simplified and more intensified. A platform that collects the software functions wished by the users is supposed to enrich and actively participate in the product development of HYDRA.

The next annual HUG-meeting will take place on 7.-8.11.2007

in Mosbach. One of the key topics will be the detection of an ideal workflow to filter and define the proposals of the practical-oriented HUG working group results as requirements on future HYDRA releases in order to transmit them fast, unbureaucratic and efficiently to the HYDRA product management.



its benefits. All HUG-members have access to the restricted area, where they have access to comprehensive functionalities like event calendar,

HUG-members benefit from:



- Possibility to influence the further development of HYDRA in participating in the working groups.
- Solving of special tasks or problems in the working groups.
- Information from the working groups.
- Exchange of experiences with other HYDRA-users (best-practice, etc.).
- Publishing of Success Stories.
- Access to the HUG internet forum.

Successful recertification in DIN EN ISO 9001:2000

The organizational system, which was established 18 years ago, has always been adopted to the changing processes at MPDV Mikrolab GmbH over the years. These efforts were

MPDV assures his processes and organization

acknowledged for the first time in 1997, when MPDV was certified according to DIN EN ISO 9001. The certification according to the process-oriented norm DIN EN ISO 9001:2000 followed in 2004. Within the scope of recertification, audits were performed in all areas of MPDV by Lloyd's Register Quality Assurance (LRQA) at the beginning of 2007. In discussions with employees as well as by checking the docu-

mentation, it could be proved that the requirements are realized according to applying norms. Roland Zanella, lead auditor of LRQA GmbH, confirmed: "The defined processes could definitely be demonstrated in practice. No deviations could be detected during the audit." The successful recertification in 2007 affirms again MPDV's current business policy.

„As a system supplier, we prove to master our core processes and have the suitable organization at hand to guarantee consistency and reproducible quality in all areas. To prove this formally we had our quality management system certified according to the international standard DIN EN ISO 9001: 2000.“ stated Hans Götz, general manager of MPDV.

MPDV is Microsoft-certified

In January 2006, MPDV Mikrolab GmbH became a Microsoft-certified partner. For this purpose, MPDV has given proof of its abilities in the Microsoft Competence "ISV / Software Solutions".



The crucial factor for this distinction was the product certification of the MES solution HYDRA and the distinctive Microsoft know-how within MPDV.

As Microsoft-certified partner, MPDV can access Microsoft development tools, advanced training programs, support services, current Microsoft software products and technical resources. Thus, MPDV goes on increasing its competence and know-how with respect to Microsoft technologies and secures the compatibility of the MES solution HYDRA with Microsoft products.

Furthermore, MPDV's customers benefit from this distinction as MPDV products and solutions can now even be better integrated into the Microsoft infrastructures.



MPDV around the world



Mosbach · Heidelberg · Hamburg · Hamm · Munich · Stuttgart · Winterthur (CH)
Amboise (F) · Fort Mill (USA) · Chicago (USA) · Sao Paulo (BR) · Singapore (SG)
Shanghai (CN) · Petach Tikva (IL) · Moscow (RU) · Koper (SL) · Suchy Las K (PL)

