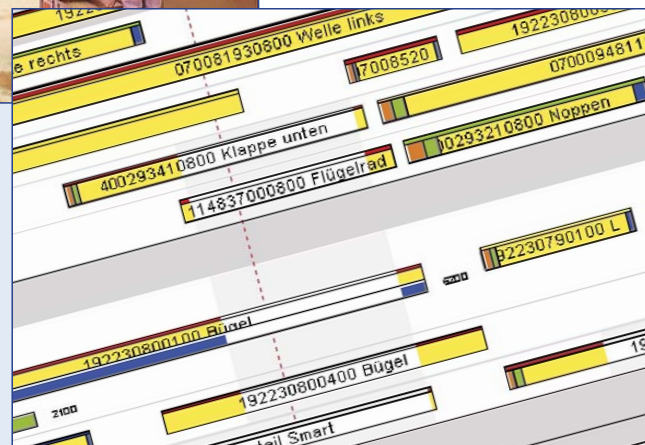


HYDRA: Transparency in the plastics manufacturing

Shop floor scheduling
Order / machine data
Process data / DNC / Tool management
Material and production logistics
CAQ / quality management
Periphery



Up-to-date production management:
Informing, planning and optimizing
Interfaces to all established PPS and ERP systems
as well as controls of leading machine manufacturers

The determining factors in the plastics-processing industry are the production of high-quality products, the reduction of delivery times and smaller batch sizes under a permanently increasing competition pressure. New requirements regarding materials, tools, machines and processes have to be implemented quickly in the plastics manufacturing. Additionally, increased effort is caused by obligatory documentation duties. These tasks can only be managed with an efficient production management covering all needs of the plastics-processing industry.

■ HYDRA for the plastics industry

The modular-structured MES (Manufacturing Execution System) HYDRA offers an industry-specific complete solution, which covers the requirements of the plastics-processing industry.

Cavity, cycle time, grain, batch and so on determine your daily practice. The corresponding data can be collected easily by means of HYDRA and are at your disposal in extensive information, evaluation and planning functions and thus support you in your daily work.

Within the quality management of the plastics-processing industry it is especially important to reveal erroneous developments at process parameters (cycle time, temperature, pressure and so on) and objective characteristics (optical and mass quality characteristics) at an early stage. Problems are immediately recognized with HYDRA and this enables you to take countermeasures early. Besides, process parameters, objective characteristics and machine conditions can also be uploaded directly from the machines. MPDV has a broad experience in this field and collaborates very tightly with manufacturers of injection molding machines.

The integration of human resource management enables a personnel scheduling, adapted to the current production situation.

HYDRA shop floor scheduling provides your schedulers and foremen with the flexibility required for the production of plastic parts.

The flexibility is not only achieved by optimizations within the area of injection molding but by considerations of previous and retroactive operations (multi-level production). Thus, it is possible to carry out cross-company and trans-sectoral analyses and to reveal potentials to optimize the production in order to achieve a cost-efficient plastics manufacturing. This trend, predetermined by the automobile industry, prevails all industries. The integration of planning, collection, evaluation, quality control and human resources marks an important advantage of the HYDRA system and guarantees a long-term and future-oriented usage.

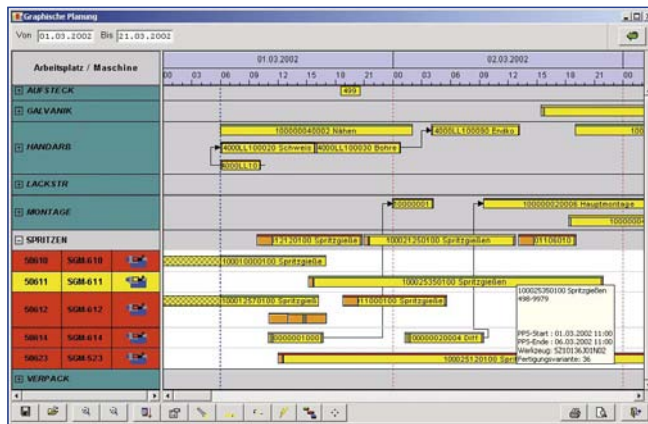
HYDRA meets all requirements that are demanded of a modern Manufacturing Execution System (MES) and thus renders an efficient and up-to-date control of production processes possible in the plastics industry.

The internet and the increasingly used electronic communication, which particularly concern the plastics-processing industry as supplier, challenge a modern software solution such as HYDRA. The internet-compatible version Hydr@Web provides all users worldwide with the entire range of HYDRA functions.

HYDRA-shop floor scheduling

The shop floor scheduling is a key function of the production control. Optimized production scenarios are created here. The possible alternatives are graphically displayed.

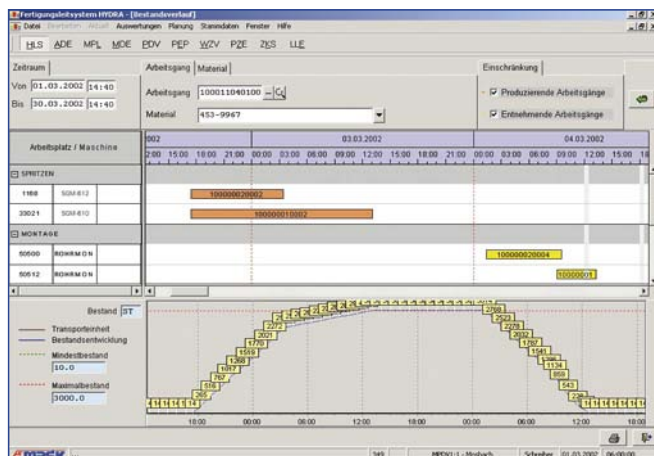
HYDRA shop floor scheduling offers a graphically supported way of working. Due to the multi-level of working, the operations of the injection-molding can optimally be scheduled together with further operation sequences.



■ Keeping control of the planning

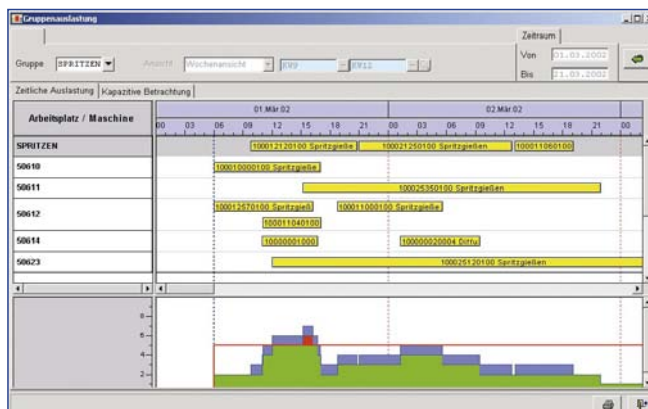
HYDRA shop floor scheduling (HLS) informs and provides for an optimized planning and considers the order sequence (color change) as well as the availability of tools, material and personnel. In doing so, start and finish dates are determined on the basis of shift models and tool data (e.g. cavity). By means of the currently collected data, the planning is updated permanently and malfunctions are included as well. For the case that due to the current situation an order is dispatched as "quick starter", the arising consequences are displayed and can be considered in the new planning. HYDRA shop floor scheduling works on a multi-level basis and prepares the planning for the injection molding machines by taking the previous and retroactive operations into account as well as further functions such as:

- automatic dispatch of the released operations with determination of a favorable production sequence
- Optimization of the machine scheduling for filling assignment gaps
- Planning of the set-up change, taking into account the times for setting up and tearing down
- Simulation
- Modifying the shift calendars to adapt to the capacity
- Modification functions for target data (quantities, times, cavity)
- Print functions with page preview
- Graphical planning board



The produced inventories are displayed graphically on the time axis.

HYDRA shop floor scheduling offers a number of functions that make an exact assessment of the planning results possible. The load graphic shows, at what time free production capacities are available and when over-assignments require a rescheduling.



HYDRA order / machine data

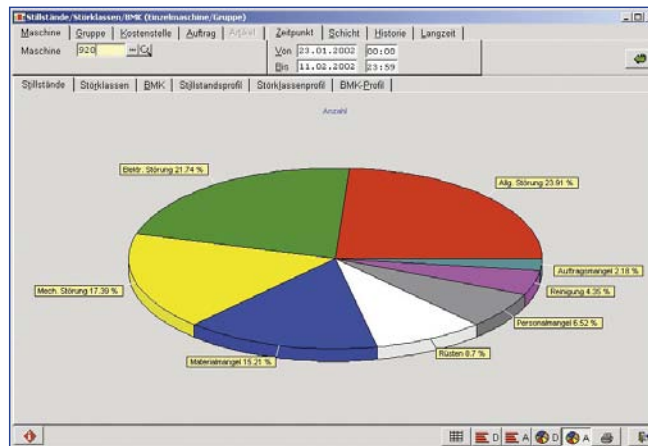
Any information of the production are collected by HYDRA. The data are directly uploaded from the injection molding machines and are available together with the manual entries as real-time information and as evaluations.

Exact production information

With the module HYDRA order / machine data collection (ADE / MDE), the user gets all information directly at his / her workplace and is in the position to react immediately in case of any disturbances. The graphical machinery shows the condition of the machines (runs / standstill / violation of warning limits, etc.) with color symbols and thus offers the complete information at one glance. If a cavity of a tool must be closed, the calculated run time prolongs. HYDRA-ADE (order data collection) establishes the relation between orders and the recorded machine data. Weak points can be determined and abolished by evaluations that can be adopted according to the individual requirements.

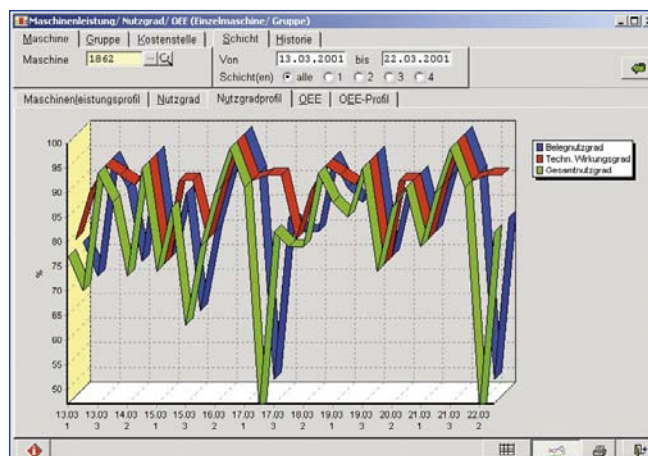
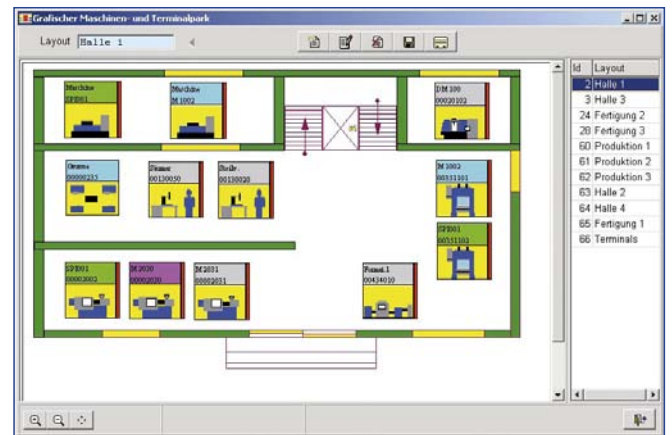
HYDRA provides for the information and delivers the technical and economical evaluations such as:

- Shift log
- multi-level production steps
- finished orders, schedule violations
- Personnel report
- Scrap statistics
- Order and article statistics
- Cost control and retroactive calculation
- Pool of orders and dispatching lists for orders
- Material consumption
- Printing of shop floor papers, time tickets, labels
- Batch, material and inventory postings
- Overview of machine cycles
- Statistics of standstills and disturbance reasons relating to machine, tool and periphery
- Long-term evaluations
- Maintenance calendar
- Overall Equipment Efficiency Index



Which standstills and disturbances appeared how long or how often in what shift? The standstill and disturbance class evaluation answers this question in a clear and illustrative form at the push of a button.

The „graphical machinery“ offers a quick overview of the current conditions of the injection molding machines and their productivity. Each user can compile his / her individual machine hall with user-friendly tools.



Especially for the controlling, HYDRA offers evaluations regarding efficiency factors with different calculation rules. Resource performance accounts, which are kept exactly according to the specifications, can be e.g. the basis for the calculation of the machine conditions.

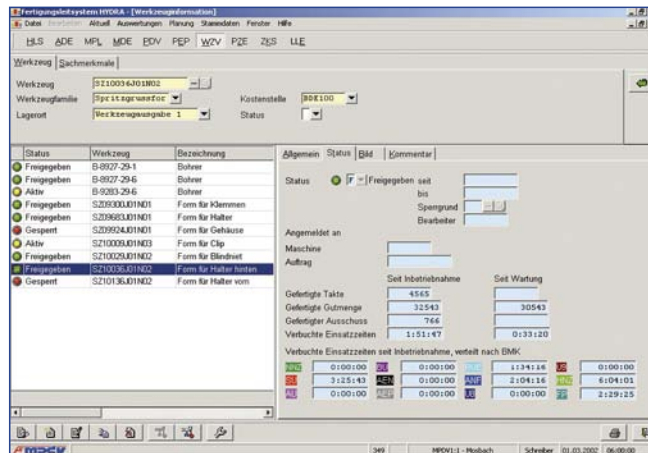
HYDRA process data / DNC / tool data

HYDRA directly communicates with the injection molding machines. The setting data are centrally administered and uploaded to the machine control via the interface. At the same time, process parameters are uploaded from the control, saved and aggregated if required and graphically displayed.

Information directly from the machine

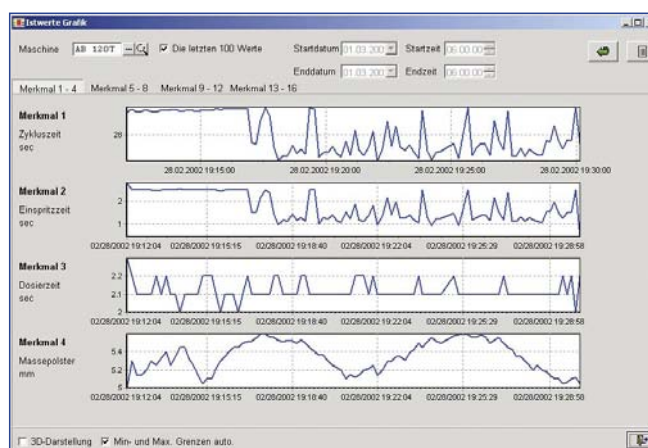
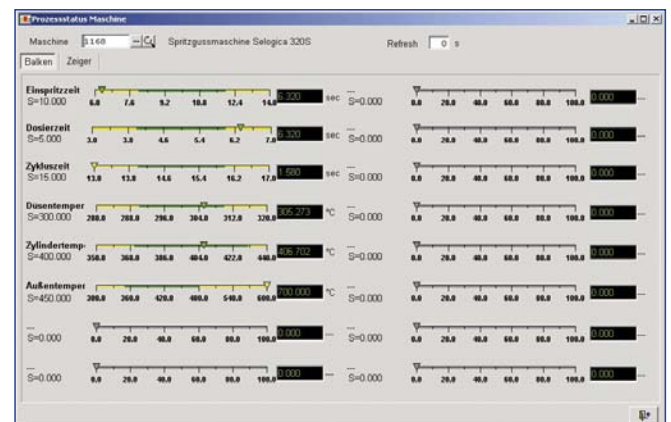
HYDRA directly uploads production and process data from the controls of the machines. Thus, the production process can be monitored with respect to violations of warning limits, such as cycle time, melt temperature or hydraulic pressure. So, pieces of information are automatically recorded and are available for interventions, middle-term evaluations and documentations. An archiving mechanics also provides for the long-term storage with an acceptable memory request. Within the DNC operation, the setting data are transferred between machine and server via the interface. The tool management shows the tool status and the tool history. All maintenance processes for machines and tools are created within the service module.

- Machine communication with controls of leading providers
- Euromap 63
- Documentation of process data
- Monitoring of the warning limits
- Graphical display of actual values
- Archiving of process values
- Setting data management (upload / download)
- Tool management
- Maintenance control according to defined intervals or quantities



The tools are divided into tool families. All pieces of information, such as storage location, cost center, status, posting of the tool operation times according to the machine status, yield, scrap, etc., are assigned to the tool.

The process data collection is adjusted to the respective machine and control type. The screenshot shows the status of different parameters.



The process data can be displayed with current or archive content in graphical form.

HYDRA material and production logistics

HYDRA controls and monitors the material flow. The batches are traced by the system, separated by grain, regenerators and master batch. Thus, a documentation of the production process is possible, which is very important for the production of plastic parts.

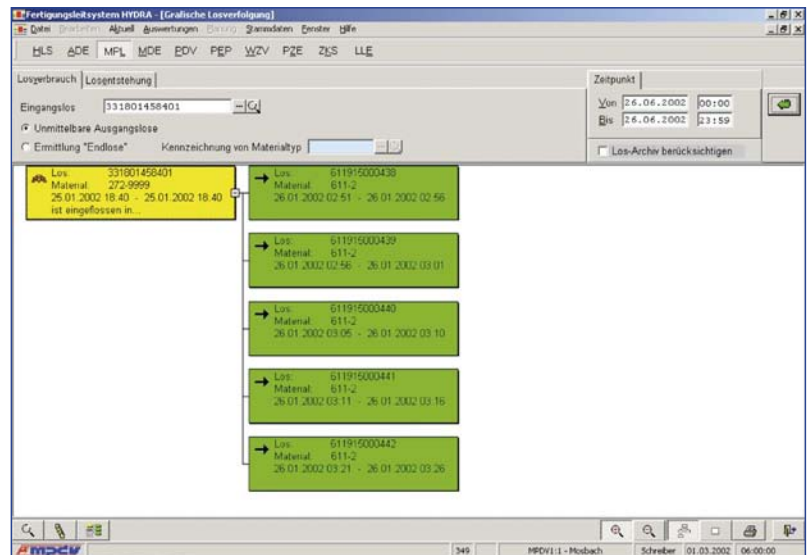
■ Transparency in the material flow

HYDRA material and production logistics (MPL) manages the inventories within the plastics manufacturing. No matter if grain, regenerator or master batch, you know which material buffer exists in which condition at which aggregate. In case of complaints, the batch tracing supports you in tracing erroneous materials and to take corrective measures. Thus, the requirements of the automobile industry and other industries concerning the product documentation are met, such as:

- Demand overview grain, master batch, regenerator
- Material availability
- Batch data overview
- Inventory overview
- Batch history
- Graphical batch tracing
- Recording of goods receipt batches
- Configuration function
- Material buffer
- Material types
- Expiry statistics
- Expiry warning report
- Estimation of the remaining material

Status	Los	Material	Herstellungsdatum	Entstehung	Klasse	MPuffer	Verfügbarkeitsdatum	Wärm
Frei	240402846221	611	25.01.2002 18:26	0	G	MP_V_1163	25.01.2002 18:26	31.12
Frei	240402846222	611	25.01.2002 18:27	0	G	WE-PUFFER	25.01.2002 18:27	31.12
Gesperrt	240402846223	611	25.01.2002 18:27	0	G	WE-PUFFER	25.01.2002 18:27	31.12
Frei	240402846224	611	25.01.2002 18:27	0	G	WE-PUFFER	25.01.2002 18:27	31.12
Prüfung	240402846225	611	25.01.2002 18:28	0	G	WE-PUFFER	25.01.2002 18:28	31.12
Laufend	275000000321	275-9962	29.01.2002 09:24	50500	G	MP_V_50500	29.01.2002 09:24	31.12
Laufend	290384378Z	498-9978	27.01.2002 01:19	0	G	MP_V_50510	27.01.2002 01:19	31.12
Laufend	2909453E8E	498-9979	27.01.2002 01:20	0	G	MP_V_50510	27.01.2002 01:20	31.12
Laufend	321675030300	272-9988	25.01.2002 18:38	0	G	MP_V_1168	25.01.2002 18:38	31.12
Laufend	331801458401	272-9999	25.01.2002 18:38	0	G	MP_V_1168	25.01.2002 18:38	31.12
Laufend	3546A6908	273-9963	27.01.2002 01:17	0	G	MP_V_50510	27.01.2002 01:17	31.12
Laufend	601703601	275-9962	26.01.2002 23:06	0	G	MP_V_50510	26.01.2002 23:06	31.12
Frei	611915000438	611-2	25.01.2002 18:47	1168	G	MP_V_50512	25.01.2002 18:47	31.12
Frei	611915000440	611-2	26.01.2002 22:24	1168	G	MP_N_1168	26.01.2002 22:24	31.12
Frei	611915000443	611-2	26.01.2002 22:28	1168	G	MP_N_1168	26.01.2002 22:28	31.12
Frei	611915000444	611-2	26.01.2002 22:47	1168	G	MP_N_1168	26.01.2002 22:47	31.12
Frei	611915000445	611-2	26.01.2002 22:48	1168	G	MP_N_1168	26.01.2002 22:48	31.12
Frei	611915000446	611-2	26.01.2002 22:49	1168	G	MP_N_1168	26.01.2002 22:49	31.12
Frei	611915000447	611-2	26.01.2002 22:50	1168	G	MP_N_1168	26.01.2002 22:50	31.12

In HYDRA-MPL (material and production logistics) the batch data administration provides the user with all important information. The coloring explains the current batch status, e.g. in process, blocked, quality inspection. The batch class informs on the quality of the material, contained in the batch. The classification of the material constitutes an important characteristic of the batch since also scrap is administered via material batches.



The graphical batch tracing provides for an especially good overview. If a batch number is entered, the corresponding input and output batches are visualized. Thus, the traceability from the finished products back to the used plastic material is possible. By means of this, you can trace back to the used material and the corresponding batch in case of a complaint. Furthermore, it can be determined in which other batches the respective material was used, too.



HYDRA-CAQ

HYDRA-CAQ is a complete quality management system that covers the needs of the plastics-processing industry. HYDRA-CAQ supports the "work-flow" in your company from the goods receipt over the gage management SPC and in-production inspection to the goods issue.

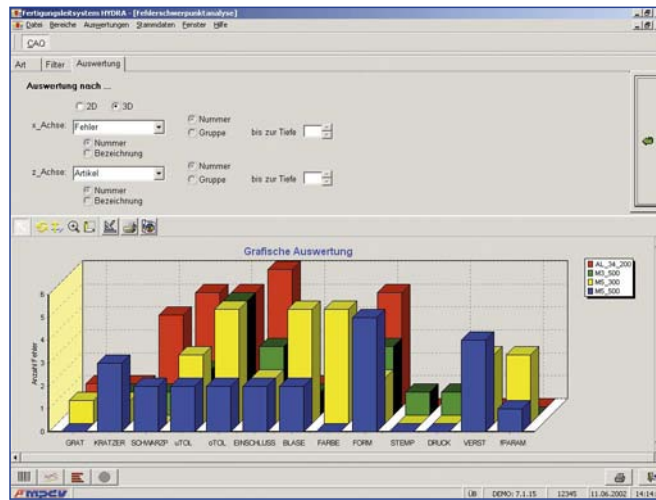
Quality manager for securing the product quality

HYDRA-CAQ notably shows the benefits of integrated systems. Besides, the key factors from the process data collection, the attributive characteristics are also recorded, inspected and archived here. The complaint management uses the batch tracing from HYDRA-MPL (material and production logistics). Goods receipt inspections and goods issue inspections as well as the gage management complete HYDRA-CAQ.

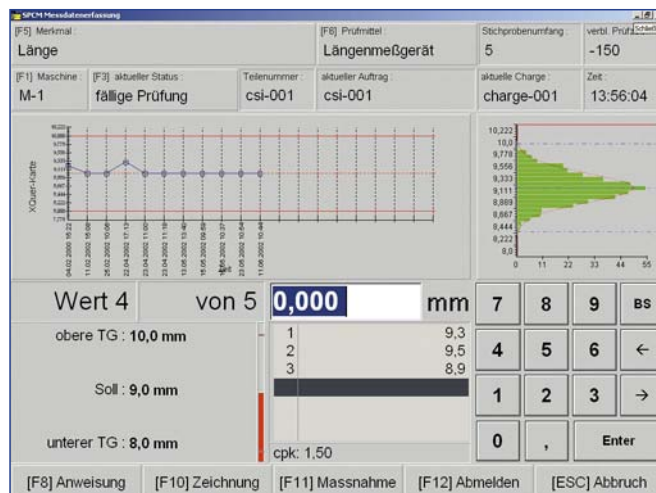
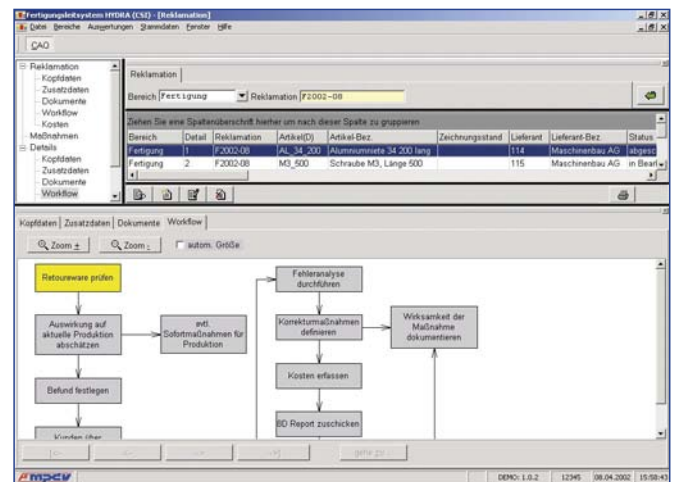
HYDRA-CAQ offers you all quality modules you require in the manufacturing processes of plastic parts:

- Control planning
- Goods receipt and goods issue inspections
- Initial sample inspection
- In-production inspection / SPC
- Nest-related evaluations
- Batch documentation
- Gage management / MSA
- Complaint management
- Failure mode analysis
- Supplier evaluation
- Mobile measurement recording

The HYDRA workflow concept monitors tasks, measures and actions. The transparency of the processes is increased by the graphical display and the status of a complaint is always obvious.



In HYDRA, the failure mode analysis gives a classified overview of the scrap reasons occurred at any time. The user can choose the form to display the information (e.g. pareto analysis, pie or bar chart, and so on).



The HYDRA inspection data collection can be carried out at the terminals of the available PDC stations. The automatic guidance by the specified inspection plan and the evaluation provide an efficient process monitoring in real-time.

The inspection data can be collected irrespectively of the place via a mobile hand-held unit or a PDA.



HYDRA-human resource management

■ The integrated time & attendance system for the personnel scheduling with the production of plastic parts

HYDRA meets the requirements of a modern human resource management system, which comprises besides the attendance and absence times with complex shift models, the personnel scheduling, incentive wage determination and access control. The personnel scheduling allows, adding the personnel capacity to the planning processes, optimized by the HYDRA-shop floor scheduling (HLS).

Even here, the complete integration shows again its advantages. PDC, time & attendance and personnel scheduling altogether “speak” of the same HR master record.

HYDRA-human resource management offers the following functions:

- Workforce planning and shift planning
- Creating and maintaining the HR master record
- Flextime, shift operation and wage types
- Flexible working time
- Authorizing overtimes and bonuses
- Accounts for overtimes, flextime, flexible time and leave
- Current account balances
- Information functions at the time & attendance terminals
- Current attendance and absence times
- Evaluations of days, months and years regarding time accounts and wage types
- Freely definable evaluations and lists
- Data post capture and project time recording
- Access control

The transition to flexible working hours is already the daily reality in many companies. HYDRA-human resource management not only records the attendance and absence times but also provides the basic data for an incentive wage determination and synchronizes production and personnel capacities via a personnel scheduling.

Personen		Januar 2002																								
Firma	Person	Name	Tätigkeit	Bereich	Kostenstelle	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18			
BSP	887	Schulz	Arbit	U	4587	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F			
BSP	895	Burger	Arbit	FE	4712	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F			
BSP	40356	Pankovic	Dumontage	LLE	105	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F			
BSP	49502	Ondler	Dumontage	LLE	105	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F			
BSP	48799	Schäfer	Drivtrier	LLE	105	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F			
BSP	50014	Albert	Meiner	FE	4711	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F			
BSP	50031	Meyer	Schlosser	FE	4711	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F			
BSP	59400	Freier	Arbeiter	FE	808100	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F			
Σ F - verfügbar						3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3		
Σ S - verfügbar						3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
Σ N - verfügbar						3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
Σ Ohne Schicht - verfügbar						5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Σ Gesamt - verfügbar						14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14

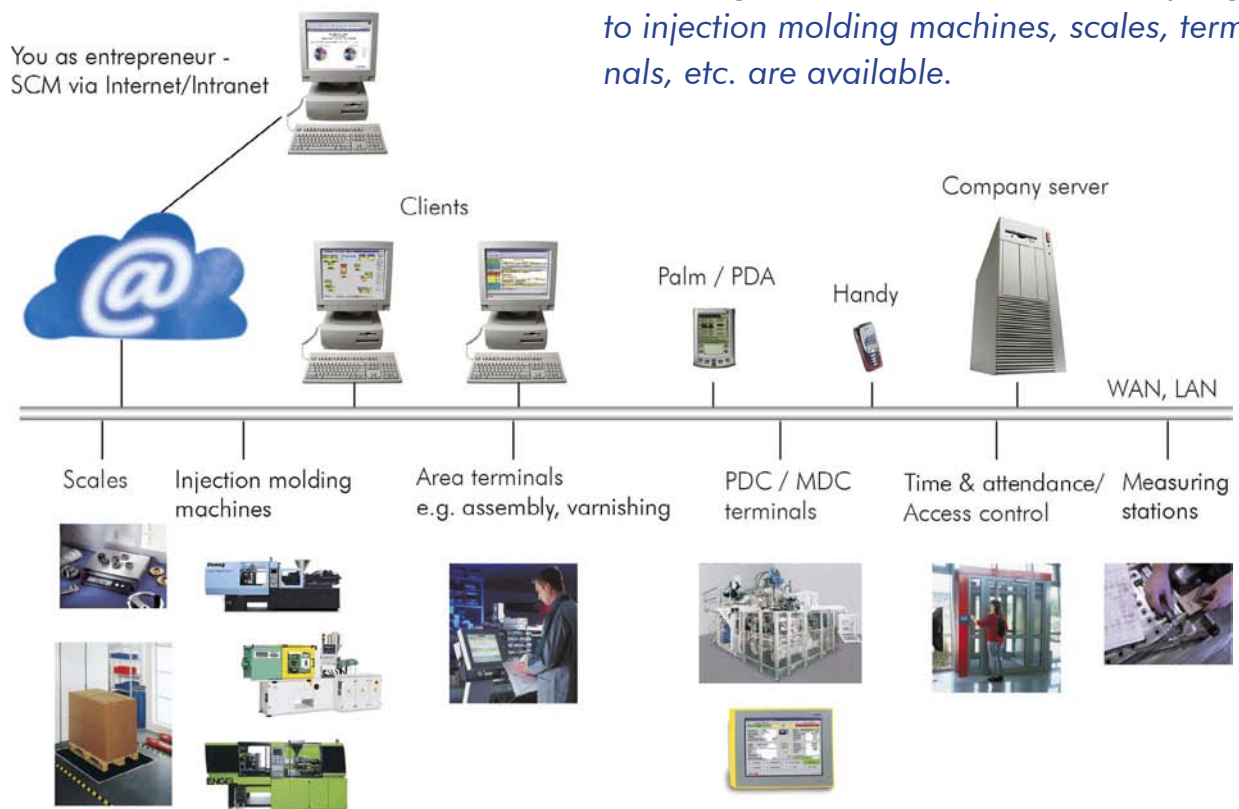
The so-called period overview is an ideal tool for the personnel scheduling. All required data of the assigned employees are clearly displayed in the individually configurable lists – if required also over long periods. The accumulated values in the lower part give a quick overview of the cost centers or the total area.

Firma	Person	Name	Status	Datum	Zeit	Fehlzeit	Datum von	Datum bis
BSP	667	Schulz, Christine	Geplant abwesend			09:00		
BSP	895	Burger, Simone	Anwesend seit			07:01		
BSP	50014	Albert, Claudia	Geplant abwesend				Urlaub	09.07.2001
BSP	50001	Mayer, Hugo	Frei seit			13:00		
BSP	59881	Braun, Albert	Frei bis			15:00		
BSP	85741	Meier, Josef	Frei					
BSP	93056	Müller, Stefan	Anwesend seit			08:23		
BSP	96665	Holzinger, Beate	Ungeplant abwesend			09:00		
0001	10002541	Merz, Klara	Frei bis			23:00		
0001	10002630	Weiss, Sabine	Geplant abwesend				Krankheit	25.02.2002
0001	10002054	Becker, Jürgen	Anwesend seit			07:55		
0001	10003645	Hoffmann, Paul	Frei					

The attendance / absence overview shows the current status at the push of a button. Thus, the basis for a secure planning of the deployment is guaranteed.

HYDRA-periphery

Within the data collection, evaluation and machine connection, HYDRA supports a broad scope of peripheral devices and coupling techniques. Evaluations can be retrieved via local clients as well as via internet-based technologies. Numerous standard couplings to injection molding machines, scales, terminals, etc. are available.



Interfaces to leading injection molding machines:

- Arburg
- Battenfeld
- Demag
- Engel
- Ferromatik
- Krauss-Maffei
- Netstal, and many others.

Interfaces to human resource systems:

- SAP R/3 HR
- CSS Fixlohn
- IBM Lohn u. Gehalt
- iPAS
- PAISY
- ABACUS
- LOGA
- Lohn XL, XXL
- LX90
- Hansalog
- DATEV
- arial
- Taylorix
- Carat, and many others.

Interfaces to the ERP/PPS systems:

- SAP R/3 PP, CO, PM, PS
- Baan IV, Baan ERP
- FOSS (ORDAT)
- FORS (Atos)
- MAPICS
- Navision
- I/OPEN
- One World (JDE)
- Brain / R+H
- BOG Dialog Total
- PSI Penta
- SoftM
- IFAX / Open
- PS Exper Team
- MAS 90
- COMET
- ProAlpha
- DIAPROD
- Orgaplan
- DTM / KIAS
- Siline
- Abas EKS
- INFOR, and many others

PDC, machine terminals and industry PCs of different manufacturers.

The production data manager of HYDRA (PDM): the tool for user-specific interface configuration. Integration of SPS of established manufacturers.



■ The complete solution for the plastic industry

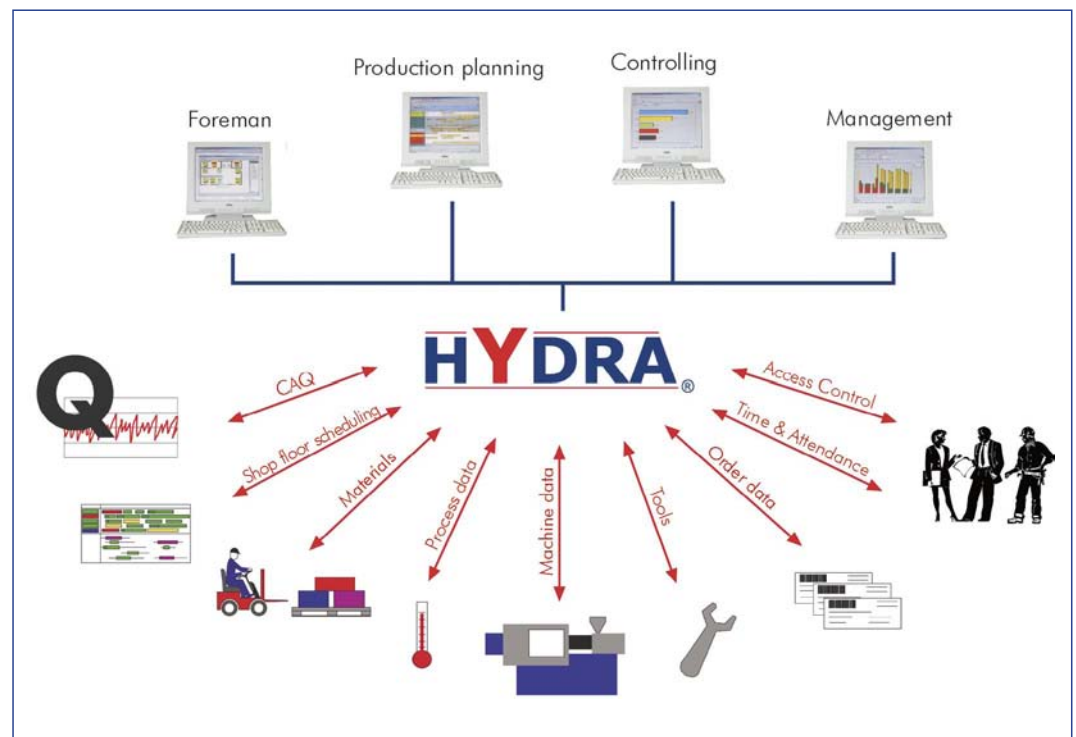
The MES solution HYDRA is the tie between the economically-oriented applications (ERP, PPS, TQM, payroll accounting systems, inventory management) and the resources involved in the production. By means of standardized interfaces to SAP, Baan, J.D. Edwards, Brain, ORDAT or many other systems, HYDRA provides for an effective, secure recording of data and a timely upload of the preprocessed data, which is of use for all company sectors. The total focus on the needs and require-

ments of the plastics-processing industry enables you to face the current challenges.

HYDRA can be used flexibly and has a modular structure: Functions for the collection, information, evaluation and planning can be installed according to the tasks with the desired functional range for the respective fields of application.

The standardization of HYDRA enables you to quickly introduce and utilize the system. Your special require-

ments can easily be covered by simply parameterizing the system. We are pleased to support you and your project team - if requested - with our extensive range of services, such as consulting, implementation and go-live, training and assistance during the implementation as well as hotline support.



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