



LP-SYSTEM

*Software for the Reinforcement
Industry*

Commercial Software
Technical Software
Machine Downloading

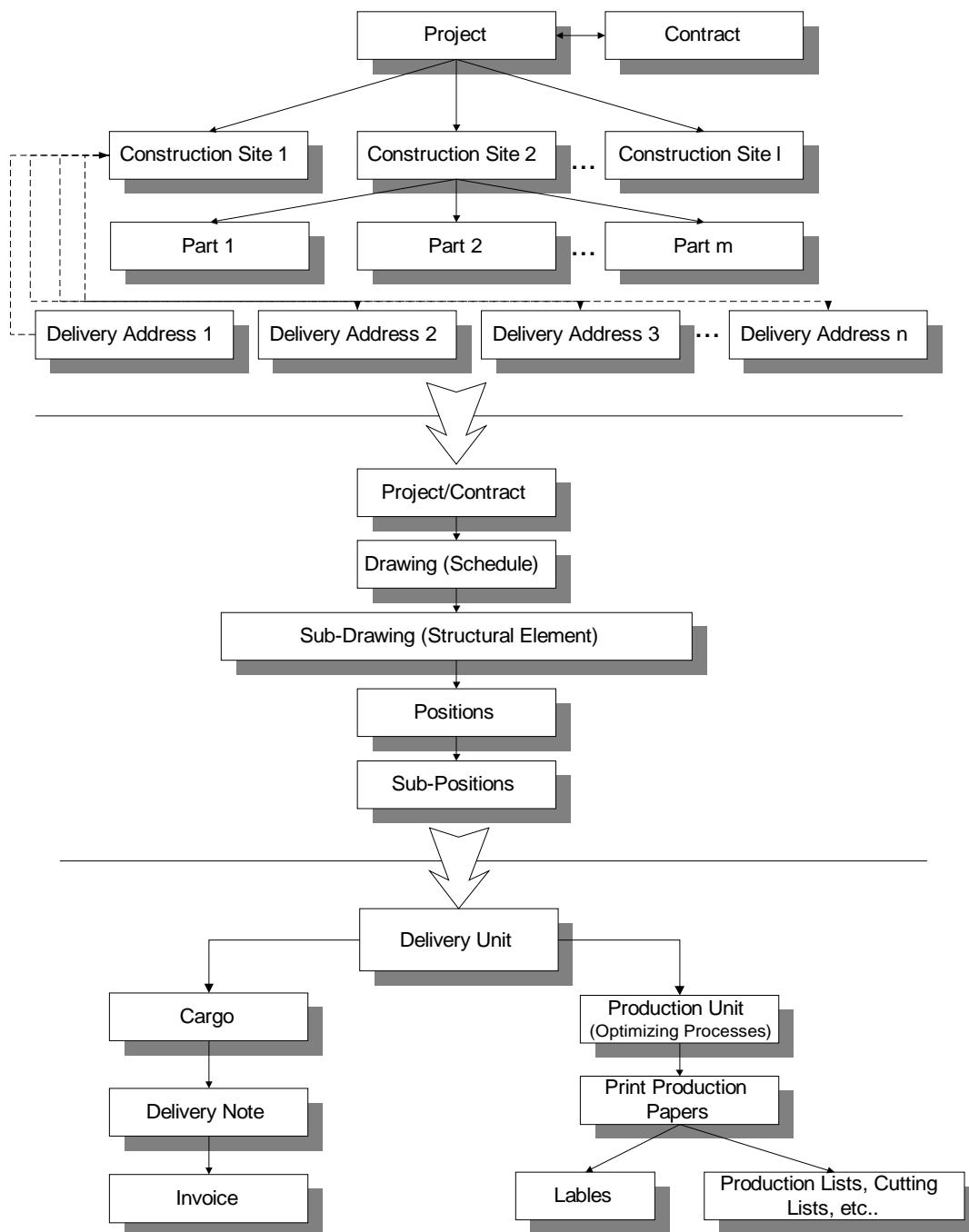
Contents

I.	SCHEME OF PROCESSES INSIDE SOFTWARE SOLUTION LP-SYSTEM	4
II.	COMMERCIAL SOFTWARE	5
A.	Main Data	7
B.	Business Partner	8
C.	Contracts	8
D.	Schedule Management	10
E.	Elements	12
F.	Mesh Welding	12
G.	Delivery Units	13
H.	Printing Tags	13
I.	Loads	13
J.	Delivery Note	14
K.	Invoice	14
L.	Incoming Invoice	14
M.	Stock management	14
N.	Order Entry Module	14
III.	TECHNICAL SOFTWARE (PRODUCTION PLANNING)	16
A.	Production/Delivery unit	16
B.	Selection of delivery units	16
C.	Printing	19
D.	Resetting of production unit	19
E.	Parameters	19
1.	Machines	20
2.	Optimization sequence	21
3.	Bending forms	22
4.	Priorities	22
5.	Stock lengths	22
6.	System	22
7.	Printer allocation	23
8.	Printer installation	23
F.	Cutting optimization for bar cutting systems	23

IV.	AUTOMATIC DATA SUMMARY.....	25
V.	DELIVERY CONTROL	25
VI.	DOWNLOADING MODULES	26
VII.	PROCEDURE OF INSTALLATION.....	26
A.	Criteria for selection of a machine	26
B.	Cabling	26
C.	Barcode Hardware.....	27
1.	Scheme of Installing Barcode-Hardware	27
2.	Installation Barcode-Hardware	29
D.	Software service and maintenance contract.....	30
VIII.	SYSTEM REQUIREMENTS LP-SYSTEM.....	31
A.	Fileserver	31
B.	Terminal server.....	31
C.	Printerad.....	32
D.	Workstation	32
E.	Machine Control Server (Only for Online Downloading)	33
F.	Modem	33
G.	Uninterruptable Power Supply.....	33

I. Scheme of Processes inside Software Solution LP-SYSTEM

Design LP-SYSTEM

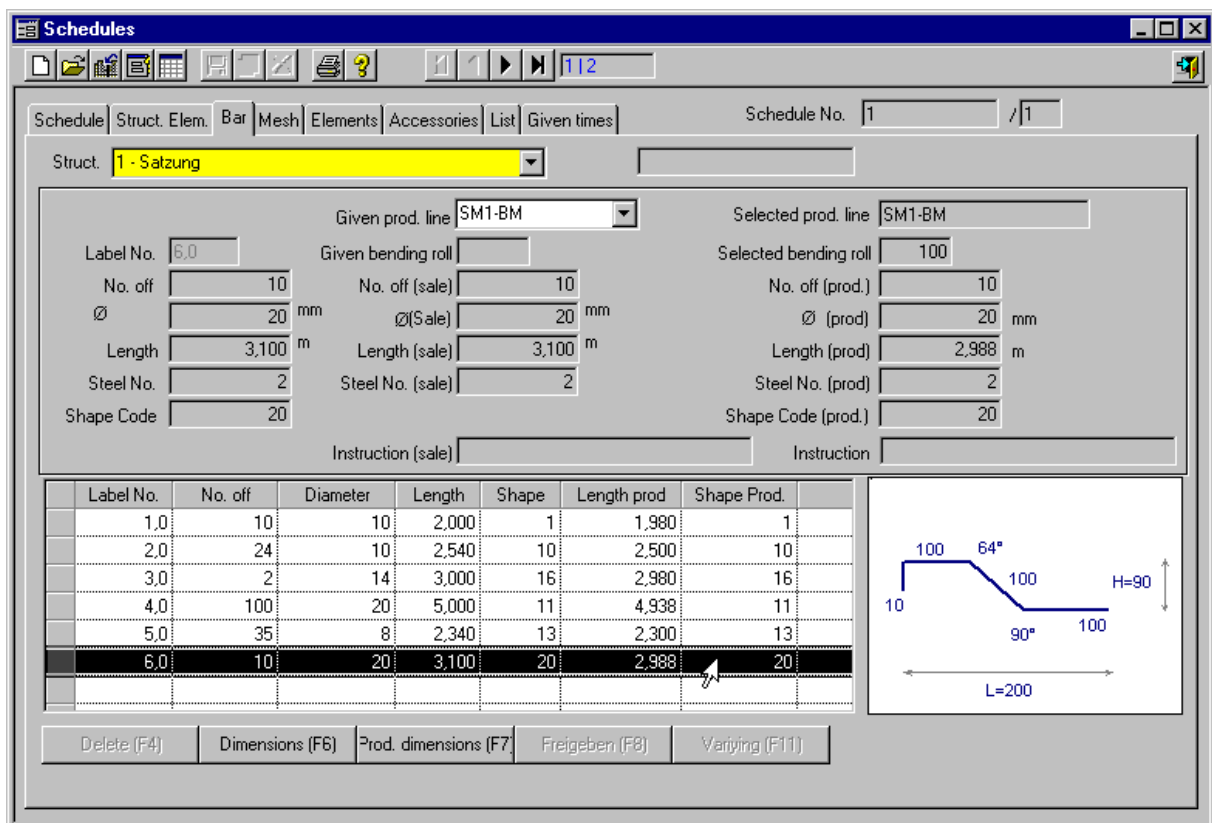


J:/Dokumente/LPB4/design.vsd

II. Commercial Software

Herewith you will find a short description of the commercial software for reinforcement of LENNERTS & PARTNER. The program is structured into the following main steps:

- Main Data
- Business Partner
- Contracts
- Schedule management



Label No.	No. off	Diameter	Length	Shape	Length prod	Shape Prod.
1.0	10	10	2,000	1	1,980	1
2.0	24	10	2,540	10	2,500	10
3.0	2	14	3,000	16	2,980	16
4.0	100	20	5,000	11	4,938	11
5.0	35	8	2,340	13	2,300	13
6.0	10	20	3,100	20	2,988	20

Schedules [16116084]

Schedule | Struct. Elem. | Bar | Mesh | Elements | Accessories | List | Given times | Schedule No. TP11 /

Struct. 1 - ...

Label No. 4,0

Product No. DS110 ...

Matchcode DS110 Distanzstreifen 110 mm

Discount 0,00 %

Factor 1

Quantity 1 30,00 St

Quantity 2 30,00 St

Weight 23,10 kg

Price 19,20 / 1 St

Total price 576,00

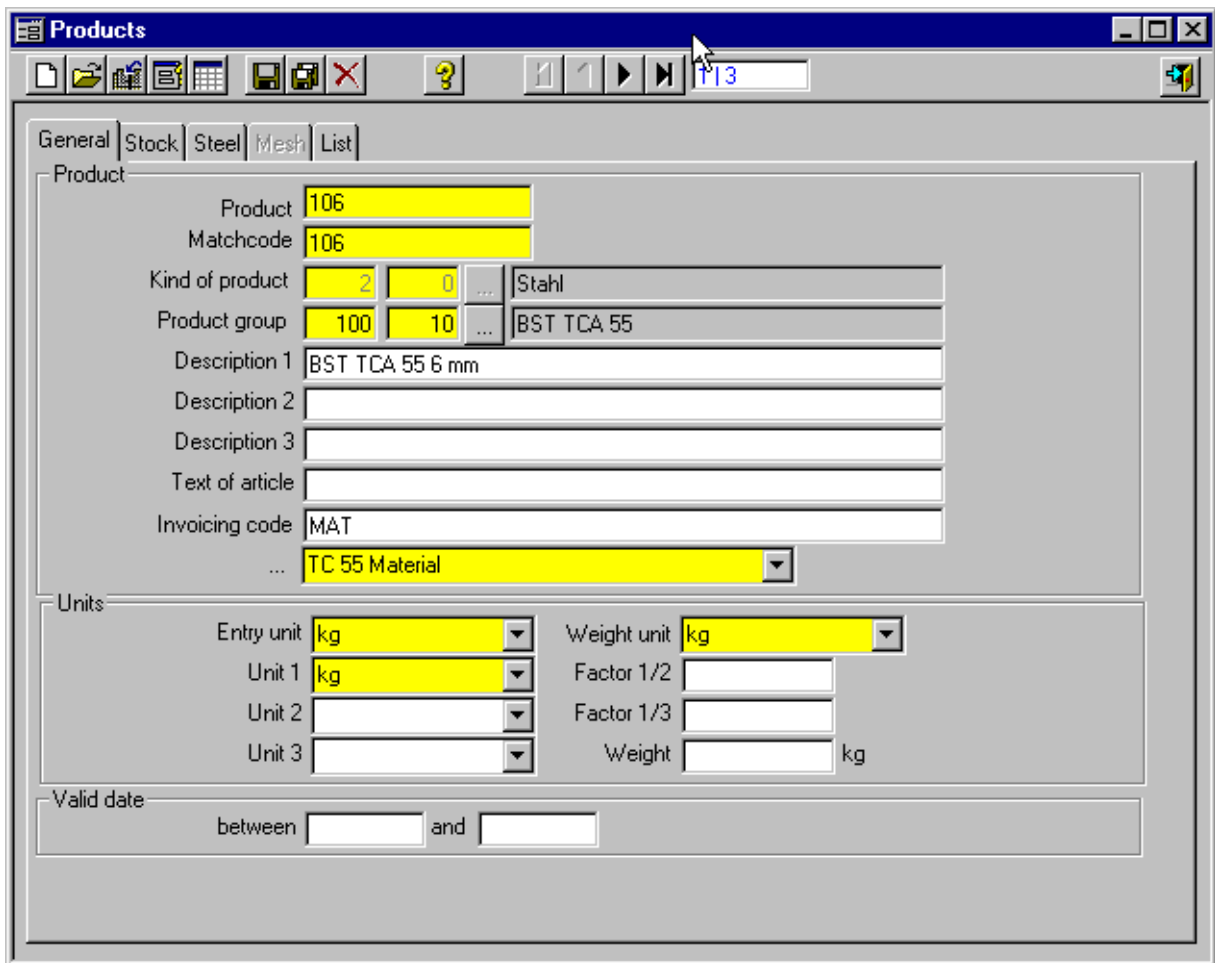
Delete (F4)

Label No.	Product description	Factor	Quantity1	Price	Total price
1,0	Distanzstreifen 180 mm	1	10	24,30	230,85
2,0	Distanzstreifen 150 mm	1	25	21,80	545,00
3,0	Distanzstreifen 220 mm	1	30	37,60	1.094,16
→					

- Delivering units
- Cargos
- Incoming invoice
- Stock management
- Printing tags
- Delivery note
- Invoice

A. Main Data

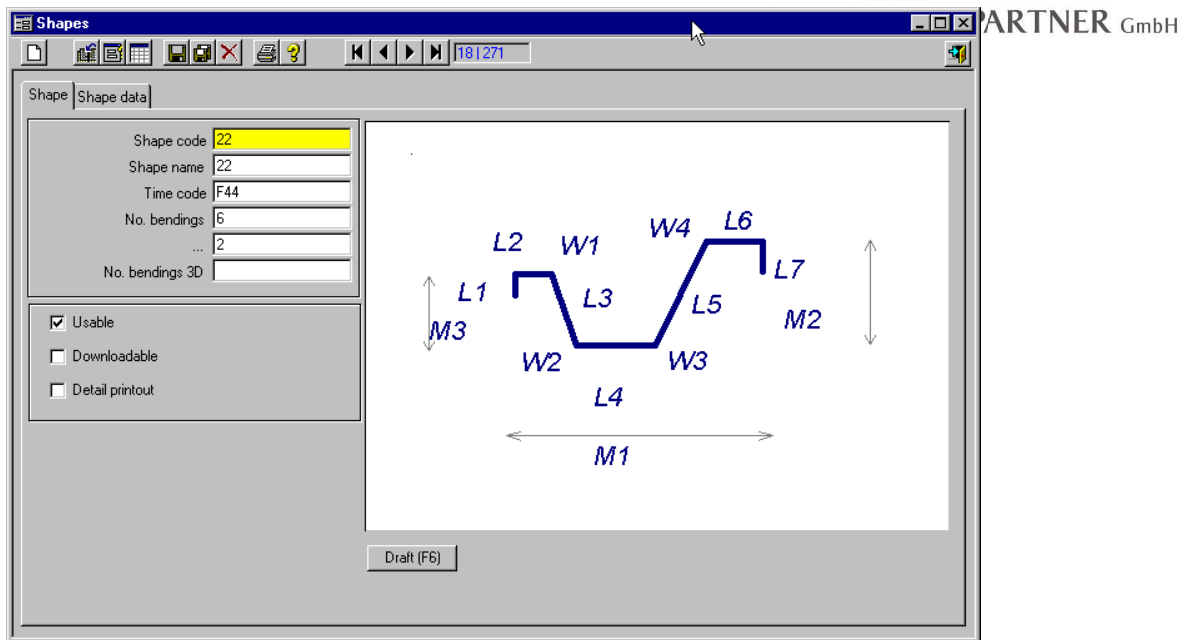
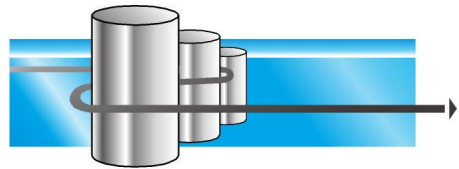
When initializing the system most of the main data are input and must never be changed. For example Products, Group of products, Tag colour, Type of freight and so on.



The screenshot shows the 'Products' window with the following data entered:

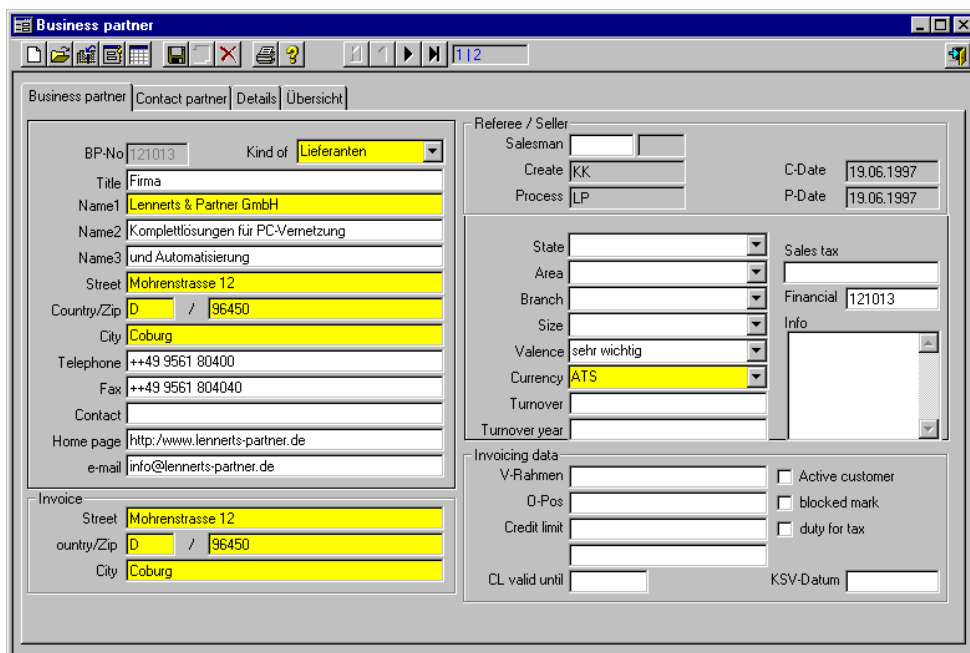
Field	Value
Product	106
Matchcode	106
Kind of product	2 0 Stahl
Product group	100 10 BST TCA 55
Description 1	BST TCA 55 6 mm
Description 2	
Description 3	
Text of article	
Invoicing code	MAT
Material	TC 55 Material
Entry unit	kg
Weight unit	kg
Unit 1	kg
Unit 2	
Unit 3	
Factor 1/2	
Factor 1/3	
Weight	kg

Valid date: between [] and []



B. Business Partner

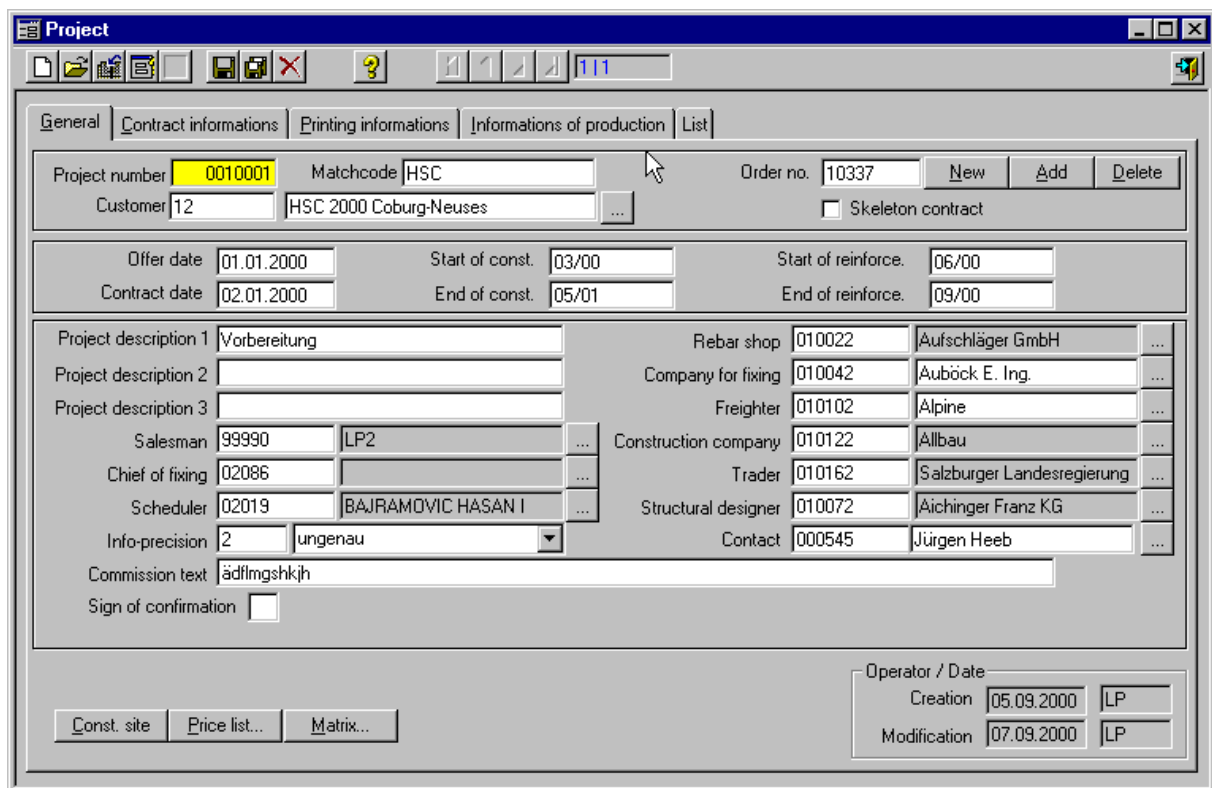
Business Partners are the sum of all companies you have contact to, e. g. customers, suppliers, freighters and so on. Each customer must be created only once in the system even he has more than one contract. Each business partner can have several contact persons. This function can be used as a telephone directory.



C. Contracts

At the contract level you describe the contract:

- Name of the construction site
- Delivery Address
- Customer
- Price
- Payment conditions
- Some other characteristics



The screenshot shows the 'Project' software interface with the following data:

General		Contract informations		Printing informations		Informations of production		List	
Project number	0010001	Matchcode	HSC	Order no.	10337	New Add Delete			
Customer	12	HSC 2000 Coburg-Neuses				<input type="checkbox"/> Skeleton contract			
Offer date	01.01.2000	Start of const.	03/00	Start of reinforce.	06/00				
Contract date	02.01.2000	End of const.	05/01	End of reinforce.	09/00				
Project description 1	Vorbereitung		Rebar shop	010022	Aufschläger GmbH				
Project description 2			Company for fixing	010042	Auböck E. Ing.				
Project description 3			Freighter	010102	Alpine				
Salesman	99990	LP2	Construction company	010122	Allbau				
Chief of fixing	02086		Trader	010162	Salzburger Landesregierung				
Scheduler	02019	BAJRAMOVIC HASAN I	Structural designer	010072	Aichinger Franz KG				
Info-precision	2	ungenau	Contact	000545	Jürgen Heeb				
Commission text	ädflmgshkjh								
Sign of confirmation	<input type="checkbox"/>								
Const. site				Price list...		Matrix...			
				Operator / Date		Creation 05.09.2000 LP			
						Modification 07.09.2000 LP			

With this information the system now only needs the informations about the schedules and all the invoices will be printed correctly.

Preisliste - specific to order

General | Single prices | Product prices (groups) | Service prices (groups)

Product-No: 110 ... BST TCA 55 10 mm Matchcode: 110

Range: 1 and 10 to

Price: 100,00 / 1 kg Sum price

Discount:

Order quantity: 2.350,000 kg identify

Kind of: 35,00 abbreviation: MAT*DA*S+B*VS*VERL*ELEM*TP

Kind of: B Base of additional: B Stock-No: 1 (GPNR: 300034 Best Baueisen- und Stahl-)

Productno	Product-description	Price	Order quantity	(unit)	(until)
110	BST TCA 55 10 mm	100,00	2.350,000	B	B
130	BST TCA 55 30 mm	90,00	1.355,000	B	B

New F2
Insert F3
Delete F4
Return F5

D. Schedule Management

For each schedule the right contract must be selected. The schedule can be split into several 'Structural Elements' (Sub-drawings) for which you can define the total number of pieces for delivery. After input of the positions you can check the input with two functions:

- Resume is the short summary for the schedule
- Steel list is a position list (on screen or printer) including the graphical shape

Schedules

Schedule | Struct. Elem. | Bar | Mesh | Elements | Accessories | List | Given times

Schedule No. 1 / 1

Struct. 2 - Vorstandschaft

Label No. 3.0 Given prod. line MSM+MBM Selected prod. line MSM+MBM

No. off 25 No. off 25 Cutting construction si No. off (prod.) 25

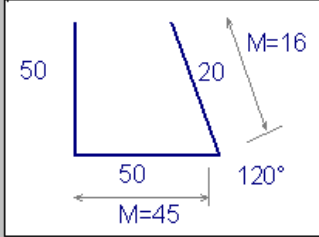
Mesh type A60 Mesh type A60 Mesh type (prod.) A60

Length 1,200 Length 1,200 Length (prod.) 1,200

Width (plan) 0,800 Width 0,800 Width (prod.) 0,800

Shape Code 9 Instruction

Label No.	No. off	Mesh type	Length	Width
1.0	2	A100	3,000	2,000
2.0	12	A100	6,000	2,400
3.0	25	A60	1,200	0,800
4.0	100	A82	2,000	2,000



Delete (F4) Dimensions (F6) Prod. dimensions (F7) Freigegeben (F8) Sum (sale) (F9) Sum (prod) (F10)

CENTURA Report Builder - h:\p4\reports\best\SchnLis.qrp

File View Print

Auftrag 10337

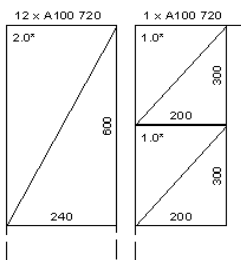
Plan 1

19.09.00 - 14:9

Vereinsgründung

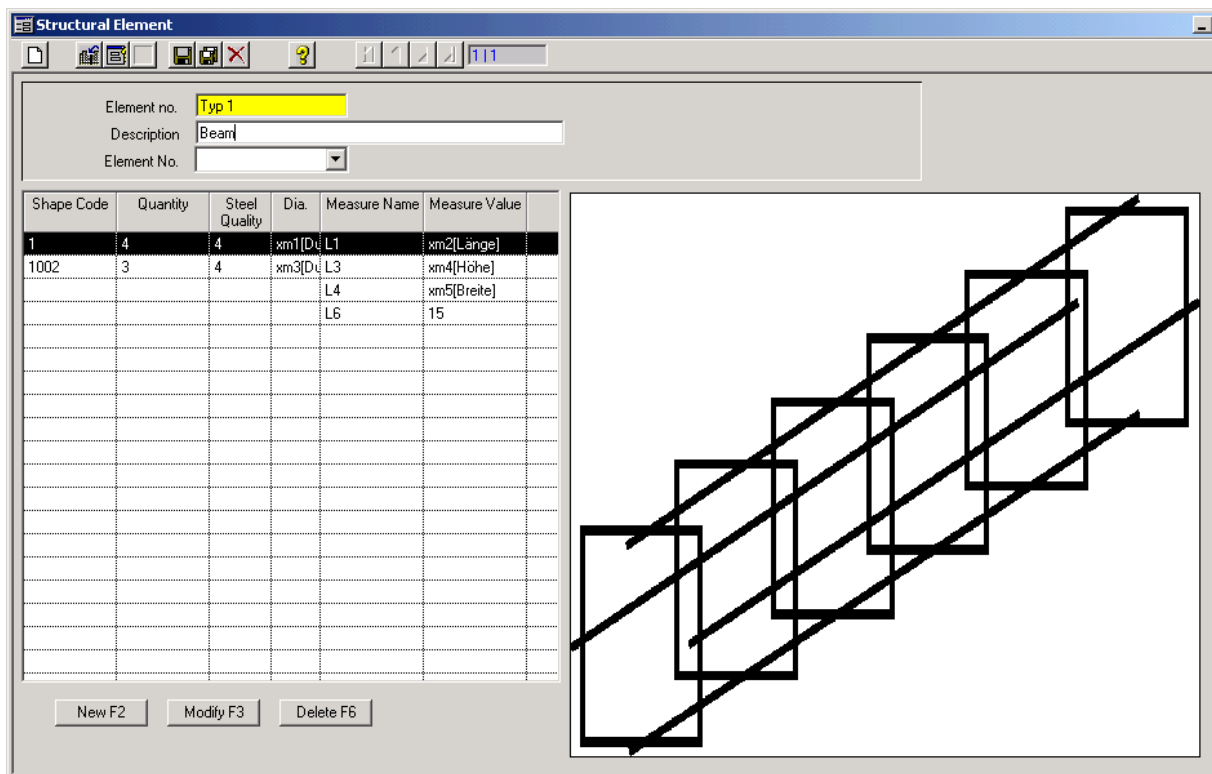
Produktion

Liefertermin: 10.09.2000 09:00



E. Elements

With the functions for the creation of elements it is very easy to manage elements and to create steel lists out of it. Later this data is also available in the optional module production planning and downloading of machine.



Shape Code	Quantity	Steel Quality	Dia.	Measure Name	Measure Value
1	4	4	xm1[Dia]	L1	xm2[Länge]
1002	3	4	xm3[Dia]	L3	xm4[Höhe]
				L4	xm5[Breite]
				L6	15

F. Mesh Welding

This module enables to make free definition of meshes and to produce them on a mesh welding line. The creation is made within the contract whereby the created meshes can also be shown on delivery note and invoice.

With downloading of the mesh welding line the productivity of the machine is increased and additional manual entries or wrong entries do not arise.

Matten schweißen (ELRM)

Plan-Nr / Index: 2 MSW
 Teilplanname: Position: 1
 Element: Matte Anzahl: 1

Länge: 900 cm Überhang unten: -5 cm
 Breite: 215 cm Überhang rechts: 10 cm

Horizontal

	Stahl- sorte	Du	Doppel- draht	Anfangs- abstand	Anzahl Abstände	Abstand	Stab- länge	Stab- versatz	Abstand auf Rand
Neu F2 →	4	10	<input type="checkbox"/>	5	60	15	215	0	<input type="checkbox"/>
Löschen F4									

Vertikal

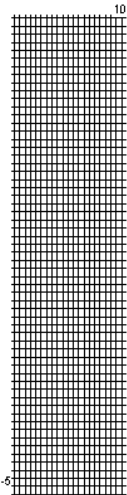
	Stahl- sorte	Du	Doppel- draht	Anfangs- abstand	Anzahl Abstände	Abstand	Stab- länge	Stab- versatz	Abstand auf Rand
Neu F7 →	4	12	<input type="checkbox"/>	5	20	10	900	0	<input type="checkbox"/>
Löschen F8									

Anzeigen Ok

900x215

Ø 10,0 215,5 60x15

Ø 12,0 900,5 20x10



G. Delivery Units

After the input of schedules you can create the delivery units. Here it can be defined which 'Structural Elements' with how many pieces you must or want to deliver at this date. Each tag which will be printed later gets a serial number.

H. Printing Tags

You can print the tags selected by the delivering units. Within the delivering unit there is the sort order diameter, straight/bended, the drawing number and length.

I. Loads

With this function you can define with which truck you want to deliver which delivery units. This defined truck load is the basis for printing delivery note and invoice.

J. Delivery Note

With this function you get a list with all positions per site for the selected load. On the end of this printout you get a short checklist twice for loading and unloading the truck.

K. Invoice

Here the invoices can be printed for a selected truck. You can select the following invoice types:

- Service and Return
- Return
- Service
- Cash in advance

L. Incoming Invoice

For correct working of the system (not only the software), the input of the incoming invoice for a contract is important before the outgoing invoice will be printed.

M. Stock management

With this function you can check your physical stock and the stock of the contracts.

N. Order Entry Module

This module is made for structural engineers, building contractors or steel traders for direct creation of their steel list and export via email to the rebar shop. After import into LP-SYSTEM all documents which are necessary for the production, the delivery and the invoicing can be produced immediately.

While structural engineers create BVBS-files with a CAD and send them to the rebar shop, all other business partners without a CAD have to do this manually. A steel list has to be created manually and then be transmit by phone or fax.

If something has to be created manually, mistakes could happen. But also transmission can be incorrect or difficult to be read on a fax.

Drawings Shapes Transfer Windows Translate Help

Drawings

New Selection Store Speichern unter Delete Dimensioning

Site Drawing Structural Element Steelpositions

Structural Element 1

Position Number 1

Count 10

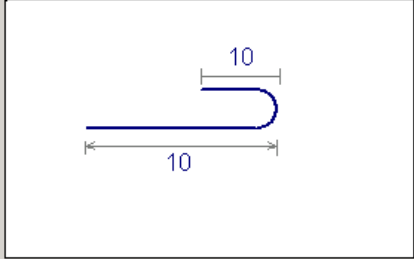
Steel type CA50

Diameter 16.0

Length 0.20 m

Shape 1105

Pos-No	Steel type	Diameter	Count	Length	Shape	Gewicht
1	CA50	16.0	10	0.20	1105	3.2
2	CA50	16.0	10	3.00	1	47.3



All these mistakes do not arise when using the data entry module. Also the additional entry of the data in the rebar shop is not necessary with its possible resulting mistakes.

III. Technical Software (Production Planning)

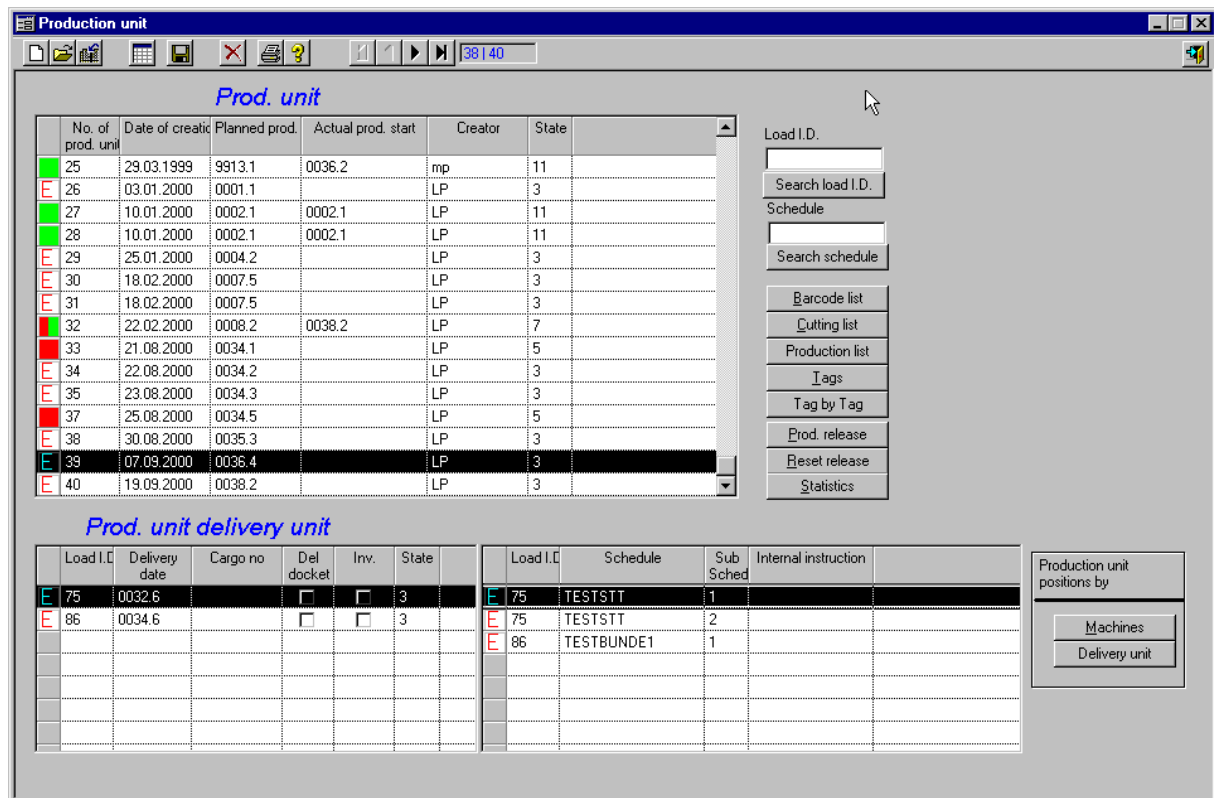
A. Production/Delivery unit

The production menu is divided up as follows:

- Schedule selection
- Resetting of delivery units

B. Selection of delivery units

Many schedules and their steel and mesh items are summarized in a delivery unit. This delivery unit is regarded as one unit in the entire system. Within the delivery unit a machine allocation takes place, the optimization of cuttings for bar cutting systems occurs and the production sequence is optimised.



Prod. unit

No. of prod. unit	Date of creatio	Planned prod.	Actual prod. start	Creator	State
25	29.03.1999	9913.1	0036.2	mp	11
E 26	03.01.2000	0001.1		LP	3
27	10.01.2000	0002.1	0002.1	LP	11
28	10.01.2000	0002.1	0002.1	LP	11
E 29	25.01.2000	0004.2		LP	3
E 30	18.02.2000	0007.5		LP	3
E 31	18.02.2000	0007.5		LP	3
32	22.02.2000	0008.2	0038.2	LP	7
33	21.08.2000	0034.1		LP	5
E 34	22.08.2000	0034.2		LP	3
E 35	23.08.2000	0034.3		LP	3
37	25.08.2000	0034.5		LP	5
E 38	30.08.2000	0035.3		LP	3
E 39	07.09.2000	0036.4		LP	3
E 40	19.09.2000	0038.2		LP	3

Prod. unit delivery unit

Load I.D.	Delivery date	Cargo no	Del docket	Inv.	State
E 75	0032.6		<input type="checkbox"/>	<input type="checkbox"/>	3
E 86	0034.6		<input type="checkbox"/>	<input type="checkbox"/>	3

Load I.D.	Schedule	Sub Sched	Internal instruction
E 75	TESTSTT	1	
E 75	TESTSTT	2	
E 86	TESTBUNDE1	1	

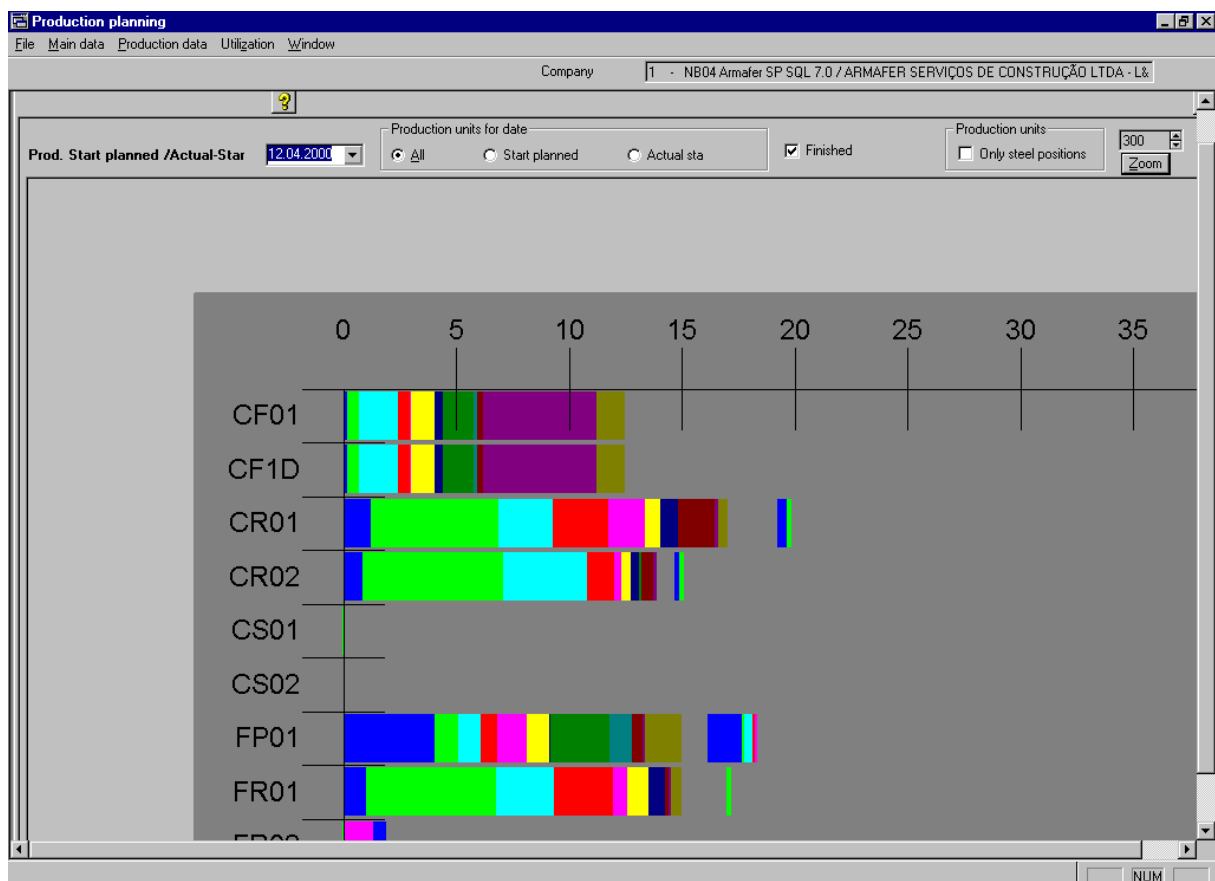
Buttons: Search load I.D., Search schedule, Barcode list, Cutting list, Production list, Tags, Tag by Tag, Prod. release, Reset release, Statistics

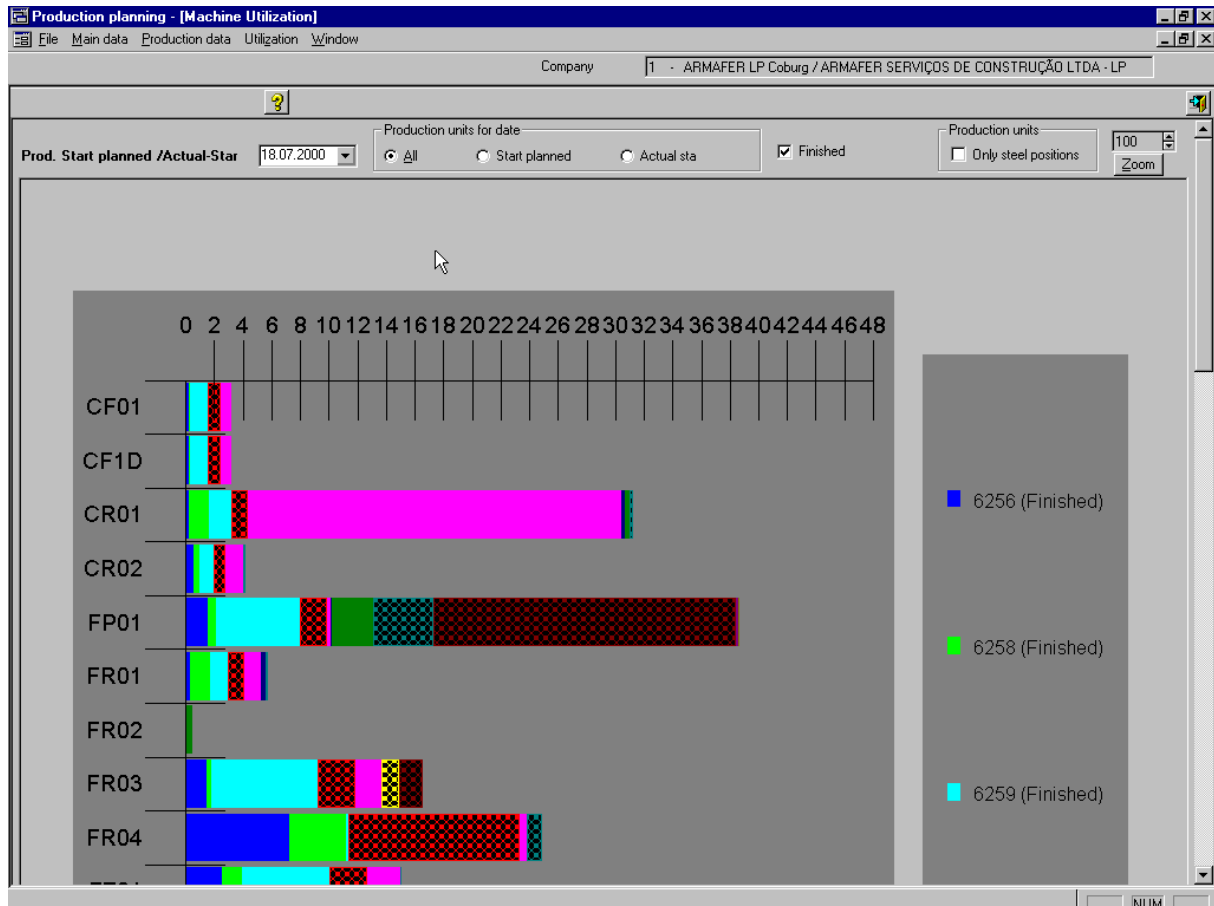
Production unit positions by: Machines, Delivery unit

All items of a delivery unit are released together for each machine at production. All schedules which are still to be produced are displayed for the generation of a delivery unit. Schedules are marked in dialogue and allocated to the delivery unit.

The user has numerous possibilities at his disposal for presenting this information: each schedule is presented according to its item and weight proportion in respect to bar, mesh and additional material. All items (bar, mesh and additional material) can be indicated for each schedule.

Furthermore, a utilisation diagram is available for each schedule, which shows the degree of utilisation the items of the schedule secure on the individual machines (number of items, weights, production times). Statistics for the schedule can be shown, which state the distribution of the items on the machines, as well as the sum of the weights for bar, mesh, additional material and the total. Statistics are shown per machine/summation for the diameter i.e. mat type and difficulties (bending).





An optimization of cuttings for bar cutting systems can be called up, which can provide statements about scraps and remains during the compilation of the delivery unit. The user can thus influence the cuttings of the delivery unit in dialogue, by changing the chosen schedules of the delivery unit and redoing the optimization.

As a result of this diverse information, the person concerned has the best possible overview of the current status of the production unit and can control the data (item data) as required.

As all important data is available immediately, the user is extremely well supported in the optimal planning of production. All questions of importance are answered on the screen without delay. The person responsible can concentrate on the actual planning tasks and need not waste valuable time researching.

C. *Printing*

Upon release of the production unit for production, all production documents are automatically printed. As well as a delivery unit list which contains an overview of all schedules for the delivery unit, production lists for each machine, cutting lists for each bar cutting system and labels are printed. The label layout which is freely definable, contains a graphical illustration of the bending form (according to user definition, also true to scale).

The labels are printed in accordance with a machine sequence and within a machine according to the production sequence.

Each printout (lists, labels) can naturally be repeated at a later point as often as required.

D. *Resetting of production unit*

This item of the menu enables delivery units which have already been put together, but not yet produced to be reset.

Production units can be chosen, whose schedules can be re-commissioned as required, after resetting. It is also possible to combine these with other schedules after a delivery unit has been completed.

E. *Parameters*

All important settings which the system will work with take place here. The definitions are as follows:

- machines
- production lines
- optimization sequence
- bending form
- priorities
- stock lengths
- system
- printer allocation
- printer installation

1. Machines

All machines available in your bending plant are depicted here in detail. Machine type (bar cutting system, stirrup bender, straightening or cutting machine, bending machines etc.) and preparation possibilities are defined for each machine. The preparation work "cutting" and "bending" are stated per diameter, i.e. for every diameter, it is indicated whether the machine can cut and/or bend this diameter.

Machine attributes: Aut/Bügelbiegeautomat

1/TCA 55 | 2/TC 55 | 3/ST 37 | 11/TCA 5511 | 12/TC 5512 | 13/ST 3713

Diameter mm	6	8	10	12	14	16	18	20	24	26	30	36	40	50
Maximum total length (cm)	500	650	650	650	650	650								
Maximum leg length	70	110	125	125	145	146								
Minimum leg length	4	4	4	4	4	4								
First minimum leg length	4	4	4	4	4	4								
Last minimum leg length	4	4	4	4	4	4								
Bending diameter (mm)	24	32	40	50	60	0								

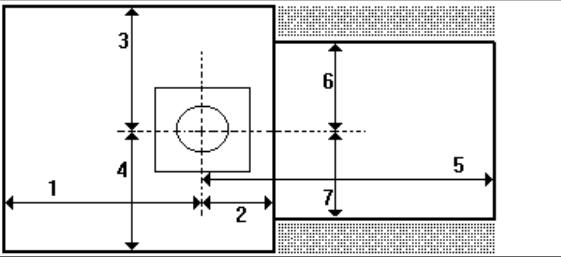
Max. number of angles:

Number of angles dual ...

Minimum number of pieces (odd)

Time bending head change s

Time diameter change s



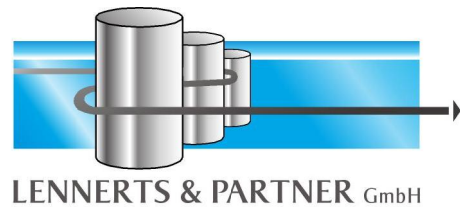
1 2 3 4 5 6 7

Max expansion (cm)

Preferred bending upside

If "cutting" is permitted for a certain diameter, the material used is entered. In this way a correct stock booking is possible. Further technical production criteria like factors for the calculation of production time standards, availability etc. are defined for each machine.

In addition, specific data is summarized according to machine type, like for example:



- available roll diameter
- standard stock lengths
- bin system
- expansion of the machine (for testing the bending form on stirrup bending devices)
- performance data (for the calculation of time standards)

The production sequence (schedule related, diameter related, bending forms, length etc.) depends on the machine and is defined by the user for each individual machine. It can be altered at any time.

In this way software can be adapted to the work flow of your bending operations.

2. Optimization sequence

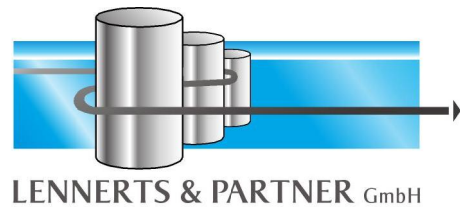
The automatic allocation of the machines occurs during the preparation of the commissioning of the schedules and/or during the entry of steel list items.

When automatically allocating the machines, it is first of all verified whether there is a fixed machine standard for the bending form of the item (see definition of bending forms). If this is the case, a test takes place, as to whether the item can be produced on the machine, on the basis of technical production restrictions (see machine data definitions). If the test result is positive, the item is allocated to the given machine. Otherwise, each machine is tested in the sequence which is given on the priority list (see definition of priorities), as to whether it can produce the item, as long as no allocation could be made.

If a machine is found, a capacity test takes place according to the system configuration. The items are allocated to the machines independently of the present utilisation.

If all items are allocated, an individual sequence optimization is performed for each machine, which assigns the items according to the efficiency principle. In this case the sequence defined by the user is adhered to (see definition of machine data). Unnecessary and time consuming changes to the equipment of the machine (diameter, steel, bend roll etc.) are thus avoided.

Where a bar cutting system is concerned, an efficient cutting optimization is performed instead of a sequence optimization, which noticeably decreases the amount of scrap and remains and thus reduces production costs.



3. Bending forms

The technical production specifications for the bending forms are defined here in relation to diameter. For each diameter, the diameter of the bending roll used for the bending form is given.

The user has the possibility to determine a set bending machine, to which the items with the corresponding bending form are allocated. Additional time values and other restrictions relating to bending forms, can be entered for especially time-consuming bending forms.

4. Priorities

A separate priority list is administered per diameter for every possible type of preparation (cutting, bending and cutting/bending). This determines the sequence in which the items should be allocated to the machines.

Maximum and minimum threshold values (length, number of pieces, weight) can be given as additional criteria, which then influence the allocation. The possibility exists to exclude certain machines for a preparation type/diameter from the allocation, i.e. this machine is not taken into account during the automatic designation of items to the machines (but is available to the user for manual allocations).

The philosophy pursued in your bending plant is thus completely depicted in the system and the automation is based on it.

5. Stock lengths

The lengths (freely definable) and diameters (6mm to ... mm) which are available as stock lengths can be specified, in dependence on available inventory lengths. Items, for which a suitable stock length is found, are then no longer allocated to a cutting machine, but are taken directly from the warehouse. These items are noted for each delivery unit on a separate production list "*stock lengths*".

6. System

The system is set up to be freely configured by the user i.e. the characteristics of the system can be adjusted and adapted to meet specific needs.

The illustration of the bending form (according to the model, line width) and further parameters for the display, can be altered by the user.

7. Printer allocation

Along with the appearance of the printout, the printer which is to print each document can also be determined.

Statistics and evaluations in the administrative office, the labels and production lists in the production halls - due to the variable printer allocation, the possibilities are endless and able to be altered at any time.

8. Printer installation

Printers can be added or removed at any time by means of the convenient graphical user surface. Printers which are already installed can be configured down to the last detail.

F. Cutting optimization for bar cutting systems

Due to the modular programming method, the bar optimization of various bar cutting systems can be applied. The following criteria are to be considered during optimization:

Cutting list																																							
Production unit 6128 FLEX PLUS 1 Steel type CA50																																							
No	Bar len	Dia	No. bars	Cycles	Bars/Cycl	Cuttings	Length	Schedule	Label	Labeling	Label bent	Boxno	Boxstat	Shape	Offcut	Scrap	VS%																						
1	12,00	16,0	217	55(1)	4	1	2,90	M83-00/B	1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	D10050 0	1																										
						1	2,90	M83-00/B	1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	D10350 0	1																										
						1	2,90	M83-00/B	1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	D10650 0	1																										
						1	2,90	M83-00/B	1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	D20050 0	1	0,00	0,40	3,33																							
2	12,00	16,0	217	55(1)	4	1	2,90	M83-00/B	1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	D20350 0	1																										
						1	2,90	M83-00/B	1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	D20650 0	1																										
						1	2,90	M83-00/B	1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	D30050 0	1																										
3	12,00	16,0	54	14(2)	4	1	2,90	M83-00/B	1	<input type="checkbox"/>	<input type="checkbox"/>	D30350 0	1	0,00	0,40	3,33																							
						4	2,90	M83-00/B	1	<input type="checkbox"/>	<input type="checkbox"/>	D30650 0	1	0,00	0,40	3,33																							
4	12,00	16,0	1	1	1	1	2,90	M83-00/B	1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	D30650 2	1	9,10	0,00	3,48																							
5	12,00	16,0	217	55(1)	4	1	2,90	M83-00/B	1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	D10050 0	1																										
						1	2,90	M83-00/B	1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	D10350 0	1																										
						1	2,90	M83-00/B	1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	D10650 0	1																										
Number of cycl: 10																																							
<table border="1"> <thead> <tr> <th>Ø</th> <th>Bar len</th> <th>Bars</th> <th>Weight</th> <th>Scrap</th> <th>Offcut</th> <th>VS%</th> </tr> </thead> <tbody> <tr> <td>Ø16.0</td> <td>12,00 m</td> <td>1191</td> <td>22552,78 kg</td> <td>750,50 kg</td> <td>3,33 %</td> <td>19,57 kg</td> <td>0,09 %</td> </tr> <tr> <td colspan="3">Total</td> <td>22552,78 kg</td> <td>750,50 kg</td> <td>3,33 %</td> <td>19,57 kg</td> <td>0,09 %</td> </tr> </tbody> </table>																	Ø	Bar len	Bars	Weight	Scrap	Offcut	VS%	Ø16.0	12,00 m	1191	22552,78 kg	750,50 kg	3,33 %	19,57 kg	0,09 %	Total			22552,78 kg	750,50 kg	3,33 %	19,57 kg	0,09 %
Ø	Bar len	Bars	Weight	Scrap	Offcut	VS%																																	
Ø16.0	12,00 m	1191	22552,78 kg	750,50 kg	3,33 %	19,57 kg	0,09 %																																
Total			22552,78 kg	750,50 kg	3,33 %	19,57 kg	0,09 %																																
Number of position: 22																																							

- flexible requirements for stock lengths

Depending on available inventory lengths, the lengths (freely defined) and the diameters which should be used, can be set for each optimization run. The selection can and should be varied in order to improve optimization.

- definition of the bin system

The number of paths as well as the bins they contain for the machine's filling system, is given for each bar cutting device. The numbering of the bins can take three different forms (horizontal, vertical and user defined). In addition to this, a maximum length must be set for each bin type, so that the system fills the individual items correctly in the appropriate bins. The items which are not to be produced because of their length can then be identified and rejected. If so wished, a certain path may be determined, into which the bar still to be bent can be filled. Otherwise bar which is still to be bent is handled in the same way as straight bar.

- freely definable machine parameters

The user can define the maximum quantity of bar for each diameter, which can be inserted simultaneously. If performance drops as a result of wear and tear of the shears, these values can naturally be adapted according to the circumstances.

To gain an overview of how long the production of items on a cutting list lasts, it is possible to consider specific time data related to the machine (speed of production...). Optionally, if and to what extent tolerances for straight bar and bar to be bent should be included in the optimization, can be stated.

Possible data for the residual lengths causes a breakdown of the cuttings into scraps and remains i.e. the proportion of these appears in the statistics described at a later point, in dependence on this information.

- settings of system parameters

This point represents the core of optimization to the user. He has the opportunity by means of these settings to be made, to considerably influence the execution of the optimization. Alternatively, the user may choose in dependence on the previous production process, whether the items of the various schedules, should be worked through according to diameters. That is, whether a schedule which has already been begun, should be completed as quickly as possible or as the case may be, successively, for all items of a diameter (naturally with a view to cutting optimization). In addition to this, the user decides whether the items of a schedule should be filled in a bin, in order to enable optimization of the work flow.



- Additional characteristics

Graduated lengths are handled differently to all other items during the optimization run. They are filled in a bin due to their low number of pieces, amongst other things. When printing the cutting list, the user receives statistics about the used stock lengths (number per length and diameter) of the cuttings as well as the computed production times.

The application of bar optimization reduces personnel time at the machine (reduced input, manual optimization), so that with the same amount of work, a higher degree of machine utilization and productivity is attained. The result is that a higher tonnage is produced at lower production costs per tonne.

Previous experience has shown that the application of bar optimization results in an increase of production for the bar cutting system (with machine control) by 30 - 40%.

IV. Automatic Data Summary

The automatic summary of data rounds off the solution for the bending plant. Here the automatic summary of all produced items in production is meant.

The worker, who operates the machine clocks in at the machine at the start of work with an identification card, which has a bar-code. All machines are asked about produced and completed items within short intervals.

This data is stored and illustrated graphically on a bar chart. It is thus possible to receive a continuous, up-to-date overview of the progress production is making.

The Data Summary registers WHO has produced WHICH ITEM WHEN AT WHAT TIME AND FOR HOW LONG and substantially increases the transparency of your production.

V. Delivery Control

After choosing a load all positions within this load will be listed and can be scanned. After finishing it one will receive a report with all missing positions and all wrong loaded positions. This list can be printed.

VI. Downloading Modules

The machine's control system transfers the data from the commissions to the machines after they have been summarized. The summary is effected by means of inputting the bar-code, which is found on the label.

It is possible to interrupt production at any time, advance other items and to continue again later. The sequence for completion can also be freely defined.

Despite the machine being steered, flexible production is nevertheless possible. The input time at the machines disappears as well as the input errors involved.

VII. Procedure of installation

A. *Criteria for selection of a machine*

The most important criteria a production planning has to take into account are, of course, within your discretion. That means that you can decide whether you accept the optimal solution as it is offered by the system or if you want to establish priorities in certain parts of the course of production.

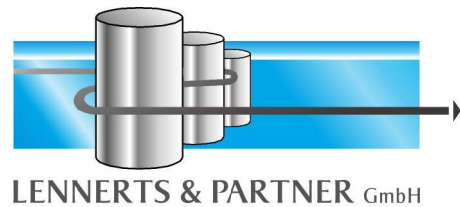
We give you a catalogue of questions which reflects the completion of your orders. Specific data are recorded for every machine:

- technical data (sizes, performance data, etc.)
- minimal and maximal threshold value
- factory-specific bundles (number of items, length, weight)
- special shapes (stirrups, etc.)
- rings and spirals

B. *Cabling*

For the installation of the PC network or the integration of the PC hardware for machine control S/UTP cables are used.

The cabling from the machine control-server to the machines is made by serial S/UTP category 5 cables and carries out the function of data transmission as well as the Data Summary.



The energy supply for the equipment for the Data Summary is made, if possible by a connection to the energy supply of the machine. Only in case the machine in question does not have an energy supply the laying of an additional live cable is necessary.

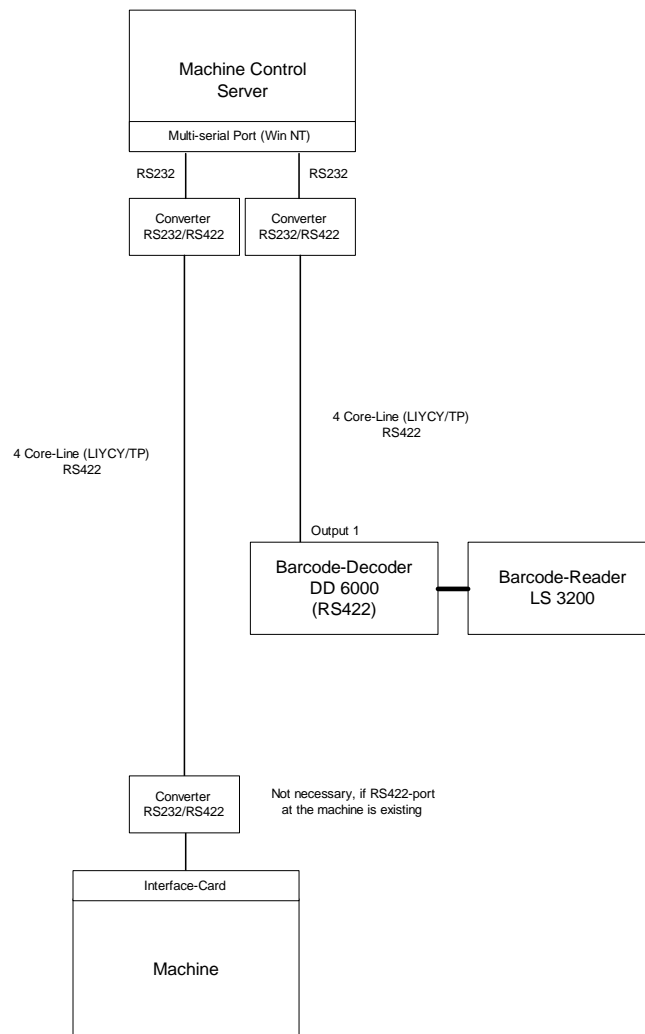
C. *Barcode Hardware*

The barcode hardware (barcode-reader, decoder and serial converters for each downloaded machine and all the machines where the data summary takes place) and the cabling to the machines should be done by local suppliers, because of the shorter response times.

1. Scheme of Installing Barcode-Hardware

Following you will get a schematic drawing of the barcode cabling from the necessary machine control server (ordinary PC inside the network) to machines with stationary control units (shearlines, double benders, stirrup benders).

Stationary Control Unit (Schematic Drawing, belongs to the Technical Environment)



2. Installation Barcode-Hardware

The physical installation of the barcode-hardware can be described as follows.

a) Required Hardware

1. Barcodedecoder DD6000 with power supply and laserscanner resp. reading pin for each machine.
2. Mounting support for laserscanner resp. reading pin.
3. Mounting support for barcodedecoder.
4. Data cabling for decoder und machine (each with 4 cores); alternatively a data cabling with 8 cores..
5. Three converters RS232 / RS422 for each machine
6. Digiboard(s), required number depends on machines to be controlled

b) Requirements

1. Free socket with 230 V on machine.
2. Data cabling (4 cores, drilled in pairs) to barcodedecoder.
3. Data cabling (4 cores, drilled in pairs) to interface of machine.
4. Alternatively data cabling (8 cores, drilled in pairs) to interface of machine. If interface and barcode decoder are wide apart corresponding cables have to be leaded accorcdingly (this will have to be clarified according to circumstances)
5. The data cables have to be marked in the office and on the machine so that an exact assignment will be possible at once.

c) Installation

(1) Alternative 1

All requirements for mounting of decoder are made. These are the following:

1. The support plates for decoder are mounted.
2. All the necessary cabling on machine exists.
3. All data cabling has to be made so that LENNERTS & PARTNER will be able to mount converter and plugs and to make connections.
4. The power supply of decoder has to be preinstalled so that this one can be connected.

When these requirements are provided installation and test will take approx. 2 hours for each decoder.

(2) Alternative 2

The requirements according to item 2 are provided and all further installation will be made by LENNERTS & PARTNER. That alternative will be invoiced according to time spent (approx. 4 hours for each decoder).

d) Additional

All in addition required hardware (e. g. cabling) will be invoiced separately.

D. Software service and maintenance contract

The software is constantly developed further in close co-operation with our clients and innovations are passed on as updates. The philosophy of our company is to achieve the highest possible degree of contentedness of our clients. Of course this makes the permanent contact with our clients necessary. Be it through visits of our external duty team, workshops, customer surveys or a short telephone call. Our experience shows that not many software producers care that much for their customers after the installation!

Two really important points are the Hotline and the remote maintenance. Under a special telephone number you can get support concerning your software problems.

Our hotline staff members are not only experts for our software but also know the work processes in the bending plants. More serious problems as they might turn up for example after a power failure are solved immediately via modem or ISDN router. Through this we have the opportunity to locate possible software defects and to inform your hardware supplier about possible hardware defects in advance.

VIII. System requirements LP-SYSTEM

State January 1st, 2011

A. *Fileserver*

Minimum requirements

- Intel Xeon Dual-Core, 2 GB RAM
- min. 20 GB free on hard disc
- Microsoft Windows 2003 incl. Service packs
- Microsoft SQL Server 2005 Workgroup Edition incl. Service packs (Notice: the database is not part of the software package)
- For further server software corresponding additional memory is necessary

Recommendation

- Intel Xeon Quad-Core, 4 GB DDR3-RAM
- Redundant discs (RAID 1, RAID 10), SCSI or SAS
- 100 GB disc space or more (2 x 36 GB + 2 x 72 GB)
- Network interface card 100 Mbit-system or faster
- CD-ROM-drive
- MS Windows Server 2008 incl. Service packs
- Microsoft SQL Server 2008 Standard Edition incl. Service packs (Notice: the database is not part of the software package)
- Backup software, possibly with SQL-Backup Agent
- For further server software corresponding additional memory is necessary

For smaller networks it is generally interesting to use MS Windows Server 2008 SBS Premium Edition as here the MS SQL Server 2008 Standard Edition for SBS 2008 is already included.

B. *Terminal server*

According to the functionality of the new windows server operating systems (the terminal services of Windows 2003 Server) it is worth to consider to implement such an environment, especially if you have older workstations which are powerful enough for the daily work but not for the new solution. Moreover this solution is often used because of the easy way to administer the network, the software and the security.

So, if you intend to set in terminal services please discuss this solution with your local system solution provider.

Due to performance and security reasons always a separate server should be used for the terminal server. Only if there are not so many users (up to approx. 5 users) a shared server would be a possible solution. However, here the standard security settings for the directories would have to be adapted restrictively.

Recommendation for a separate server

- Intel Xeon Quad-Core, min. 8 GB RAM
- Mirrored hard disks, approx. 72 GB
- Network interface card
- MS Windows Server 2008 or Citrix Metaframe

C. Printerad

Minimum requirements

- 1 unit, with suitable windows driver
- connected to the network (e. g. on fileserver, print server)

Recommendation

- 2 units, with suitable windows driver
- Laser printers with more trays can be used
- connected to the network (e. g. on Fileserver, Print server)

D. Workstation

Minimum requirements

- Intel Xeon 2 GHz, 1 GB RAM
- Graphic card with a resolution of minimum 1024 x 768 pixels
- Mouse
- Microsoft Windows XP Professional
- connected to the network
- For further software corresponding additional memory is necessary

Recommendation

- Intel Core i5, 3 GHz, 3 GB RAM
- 19" TFT Display
- Network interface card 100 Mbit-system or faster
- Mouse
- Graphic card with a resolution of minimum 1280 x 1024 pixels

- Windows Vista or Windows 7
- connected to the network
- For further software additional memory has to be considered and our technical stuff first.

E. Machine Control Server (Only for Online Downloading)

Recommendation

- like workstation, but additional
- 17" Colour monitor
- serial ports after consultation with LENNERTS & PARTNER
- remote access to the PC-console via RDP or similar

F. Modem

- IP-router or
- Dial-in via RRAS resp. RAS on Windows 2003 resp. workstation or
- VPN-connection only via Microsoft Client
- Remote desktop access on server

G. Uninterruptable Power Supply

Recommendation

- Online-work or interactive UPS
- 1000 VA
- Use for fileserver, printer, operation-PC

Alternative

- Online-work or interactive UPS
- 3000 VA or above
- Management software for NT
- Use for complete computer equipment

For new providing or completing the recommended hardware should be taken as basis.

If other software products should be used on the computer so corresponding extensions according to their information have to be considered.



We would like to point out that it would be meaningful to have a certain inventory of replacement hardware in stock, in order to counteract possible breakdowns (e.g. defects, theft).

LENNERTS & PARTNER GmbH
Mohrenstraße 12

96450 Coburg
Germany

Tel: +49 (0) 9561/80 40 0
Fax: +49 (0) 9561/ 80 40 40

www.lennerts-partner.de
support@lennerts-partner.de