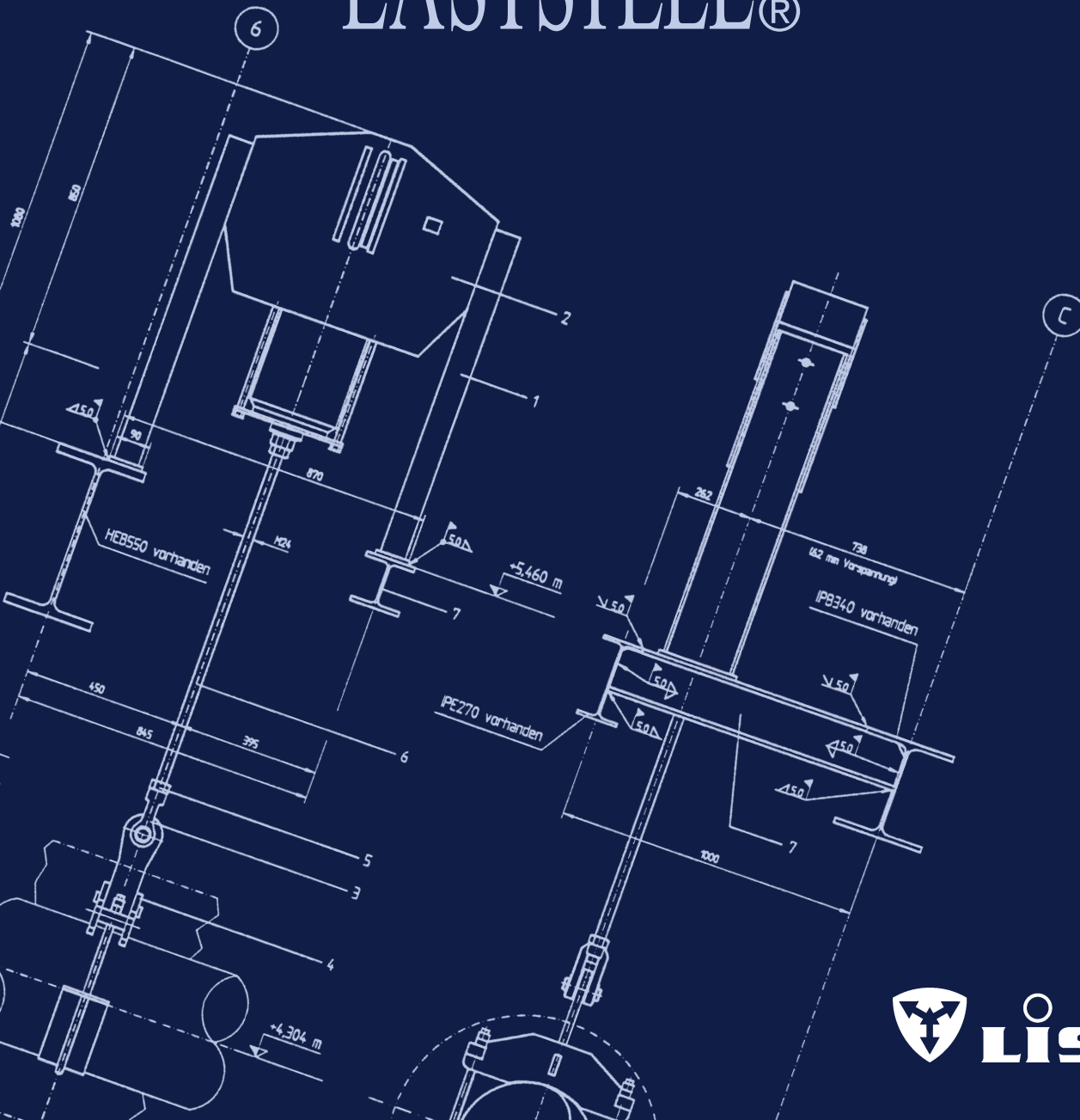
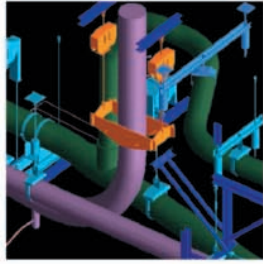


LICAD[®] EASYSYSTEEL[®]



PRODUCT
GROUP



LICAD

LICAD - Drawing N°

PR.01 10/11/1999

Load [Cold] 52.4 kN Hanger mark N°

Hydro test load 59.1 kN MSL1000Z04A

Drawing N°

1000Z014A01

Pipe diameter 500.0 mm

Temperature 460 °C

Insulation 160 mm

Min-lateral 12 mm (+Y)

Min-horizontal 55 mm (+X)

Min-vertical 112 mm (+Z)

LISEGA EASSTEEL [End connections]

Building Connection

Beam

Plate

None

W12x48

Height 403.3

Width 191.5

Flange 17.7

Web 92.5

Plan Position: 2

Building Connection

Beam

Plate

None

W12x48

Height 303.3

Width 203.3

Flange 13.1

Web 7.5

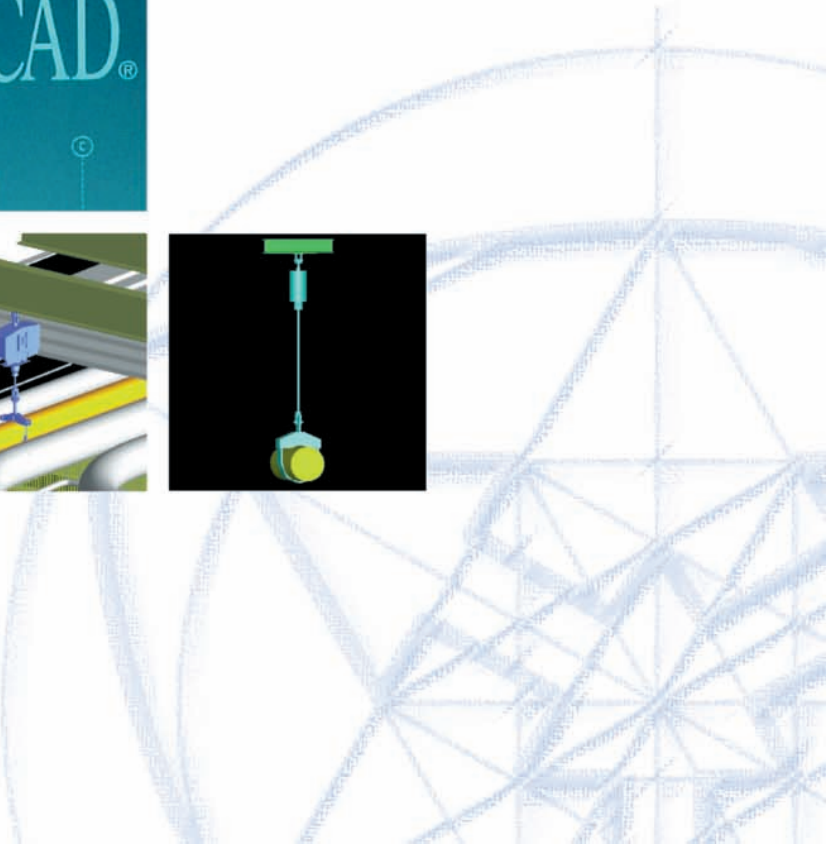
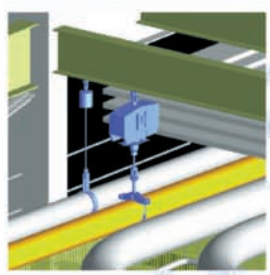
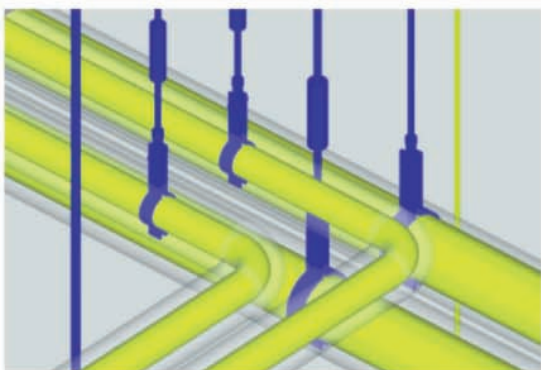
LICAD

LOCATION PLAN

ACTUAL INSULATION ACC. TO LOCATION PLAN

INDEX DATA			
HANGER SIZE	Ø80		
PIPE INSULATION	Ø100		
MAX. SPACING	300		
LOAD ADJUSTED	Ø 80		
VARIABLEITY	- X		
MINIMUM LEAD	MIN. 60		
PROT. LEAD	Ø80x4		
STATE INSULATION	Ø80		
COLD LOAD	Ø80x4		
STATE INSULATION	Ø80		
REMARKS	1. 301		
HANGER TOTAL WEIGHT	Ø80 x 4		

ITEM	DESCRIPTION	QTY	UNIT	REMARKS
1	Hanger rod	1	Ø80	
2	Washer	2	Ø80	
3	Nut	2	Ø80	
4	Washer	2	Ø80	
5	Washer	2	Ø80	
6	Washer	2	Ø80	
7	Washer	2	Ø80	
8	Washer	2	Ø80	
9	Washer	2	Ø80	
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LISEGA DESIGN DEVELOPMENT TOOLS

8

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LISEGA engineering software tools _____	8.1
LICAD design program _____	8.2
EASYSSTEEL design program _____	8.5
Component libraries _____	8.11
Interfaces to CAD programs _____	8.11
NAVISWORKS design viewer _____	8.12

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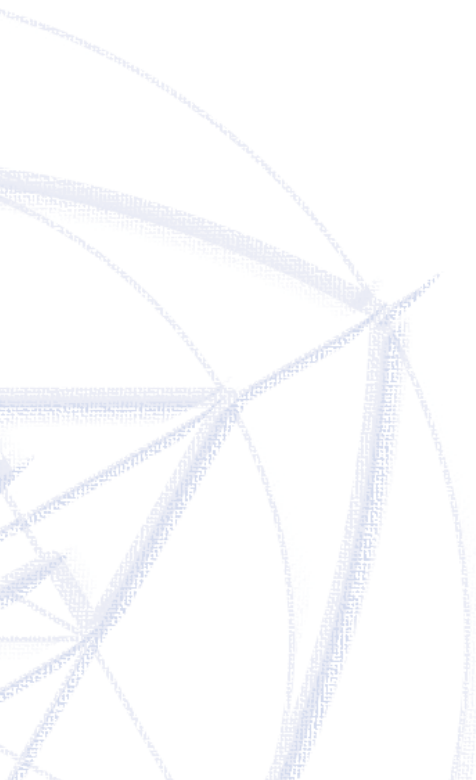
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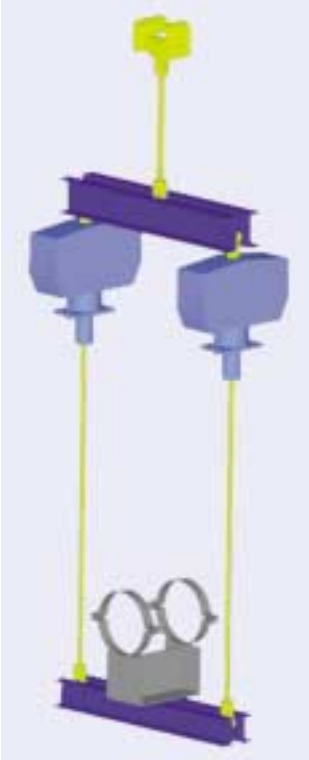
7

PRODUCT GROUP **8**

9



LISEGA DESIGN DEVELOPMENT TOOLS



The intelligent solution for support planning

LISEGA's unique modular system was the prerequisite for the creation of highly sophisticated user software. The solutions on hand open up new opportunities for increased engineering design efficiency, improved quality and significant savings in project manhours.

The general introduction of 2D and 3D CAD modelling has already had a dramatic effect on the design process for pipework systems. However, the benefits for pipe support design have been limited because supports were not included in the 3D CAD programs.

The LICAD® program has set new standards in this field. It allows the generation of pipe support drawings, bills of materials and 3-D models in minutes rather than hours. LICAD is an intelligent front-end program that provides all the required interface data for all common CAD software programs from a single source. From the point of view of quality this single source function cannot be overemphasised. To exploit further fields of application for

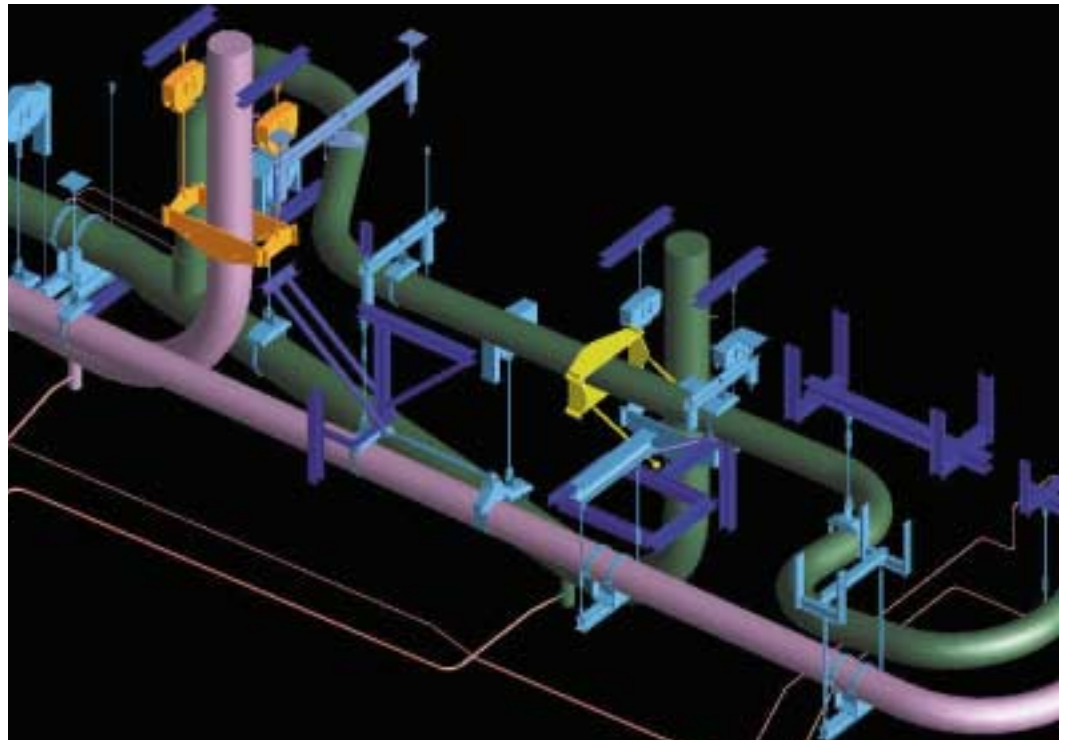
the LICAD user, LISEGA has also developed supplementary software. The complete package includes:

- LICAD planning and design software for pipe supports
- EASYSTEEL design program for secondary steel
- import and export interfaces for tables and databases
- interfaces with 3D CAD component packages
- 2D / 3D libraries for different CAD programs
- interfaces to independent 3D viewer programs
- Internet communication systems for downloading program updates and transmitting project information including drawings and orders

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LICAD®

EASYSTEEL®



Via the export function, the support designs can be integrated into complex 3D views

SOFTWARE WITH PROFIT EFFECT

Needed first - designed last

As a rule, the planning and design of complex pipe systems runs through numerous phases of optimization. Inevitably, the design of pipe supports takes place at the end of the whole process, and therefore often comes too late to ensure prompt delivery.

Although the supports are needed on site beforehand in order to ensure optimum installation of the piping, they lie right at the end of the planning chain.

At this point, it is even more vital to avoid unnecessary delay. The time factor is now all important.

LICAD speeds up the planning process

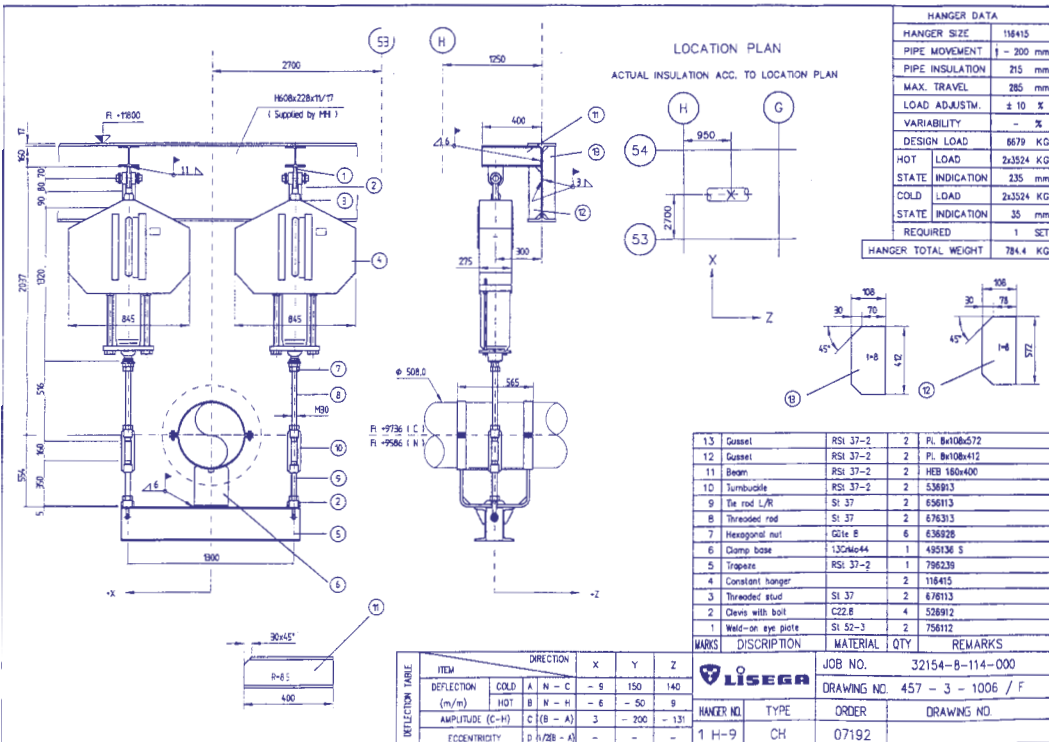
LICAD, the unique LISEGA design program for pipe supports, sets the highest standards in efficiency. With LICAD, poring over catalogs and the painstaking preparation of bills of material can be dispensed with. The design of supports and load chains no longer needs to be configured manually and then drawn up at great expense in time and money. What otherwise takes hours to produce can be done in minutes electronically - at the click of a mouse!



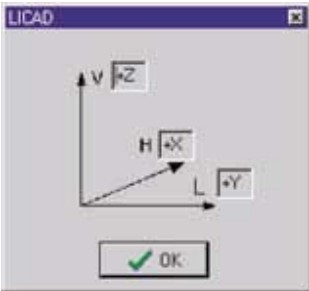
The latest version is now available as Release 8 in the following languages: English, German, Spanish, Polish, French, Japanese and Chinese

Future orientated logistics

Via LICAD, savings in time are possible in the logistics process from planning right through to delivery. For example, if required the LICAD data can be sent directly by a customer to our main computer system for order processing on the same day. This fits in well with ever tighter order schedules!



AutoCAD drawing based on a LICAD design



Free designation of axes

LICAD is simple to use

The relevant data for individual support points is entered using a menu driven program control. Only 6 parameters are required in order to find the optimum solution.

- pipe diameter
- temperature of the medium
- operating load
- travel
- installation height
- support configuration



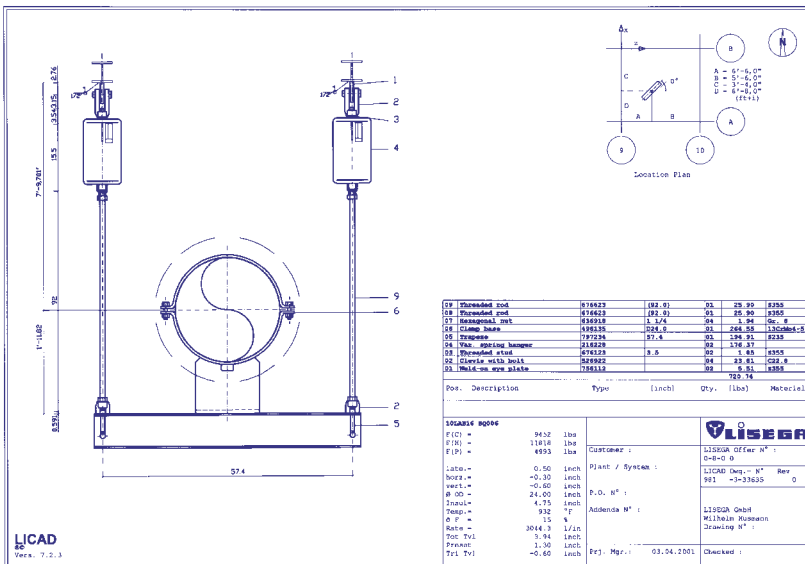
Simple registration of extra data required

From this input, the appropriate load chains are created automatically and in fractions of a second. The optimum selection of variable spring and constant hangers is made by the program simultaneously. Specific customer requirements, such as travel and load reserves in accordance with ASME, B 31.3, VGB or other codes, are taken into account. This is provided for by the corresponding input in a special menu. Considering these requirements, the programmed algorithm always ensures that the most economical solution will be selected from the possible options.

True to scale drawings

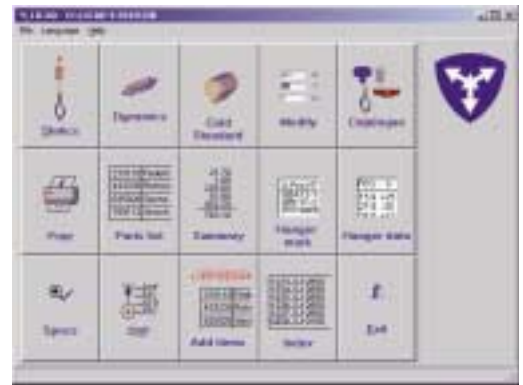
The support chains created are automatically saved as complete assemblies and can be printed or plotted as a drawing at any time. They are true to scale and contain all relevant details, including parts lists with weights and material, and if required, pricing and location plan.

LICAD drawing generated by a standard printer



LISEGA modular system forms the basis

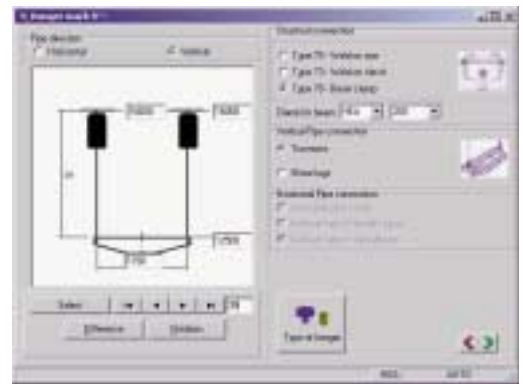
A database system forms the basis of the program which the complete LISEGA product range is incorporated into as a functional modular system. From more than 8000 standard items, compatible herein with regard to loads and connections, more than 100 standard configurations cover practically any installation situation.



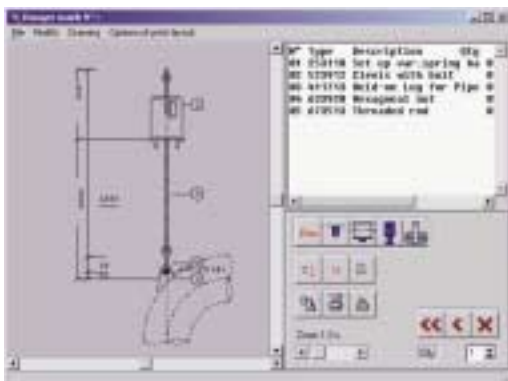
All essential functions at a glance



Clear prompts for all significant data on the relevant support



Selection of support configurations



The fully designed support with detailed bill of material



Simple uniform surface for export function

Auxiliary steelwork

LICAD creates ready to install load chains from standard supports, from the building connection right through to the pipe-surrounding attachment. In order to produce the connection to the existing structure, supplementary auxiliary structures are frequently required.

Via a special interface, the appropriate LICAD designs are transferred to a separate CAD program (e.g. AutoCAD), where they can be supplemented as desired. In most cases, where designs are not too complicated, EASYSTEEL (see page 8.5) offers the ideal solution.

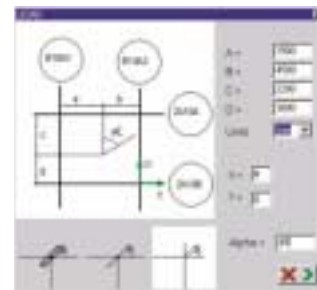
Interference checks

For larger plant projects, the design of the building structure, including steelwork, main components and piping, is carried out via 3D CAD programs, such as **PDS/Microstation (Intergraph)**, **Plant Space (Bentley)** or **PDMS (CADCENTRE)**. Planning continuity, as well as the need to consider possible interferences, necessitate the inclusion of the pipe supports in the process. Using **defined interfaces**, LICAD support designs can be transferred with no additional effort **three-dimensionally and true to scale** into the leading CAD programs .

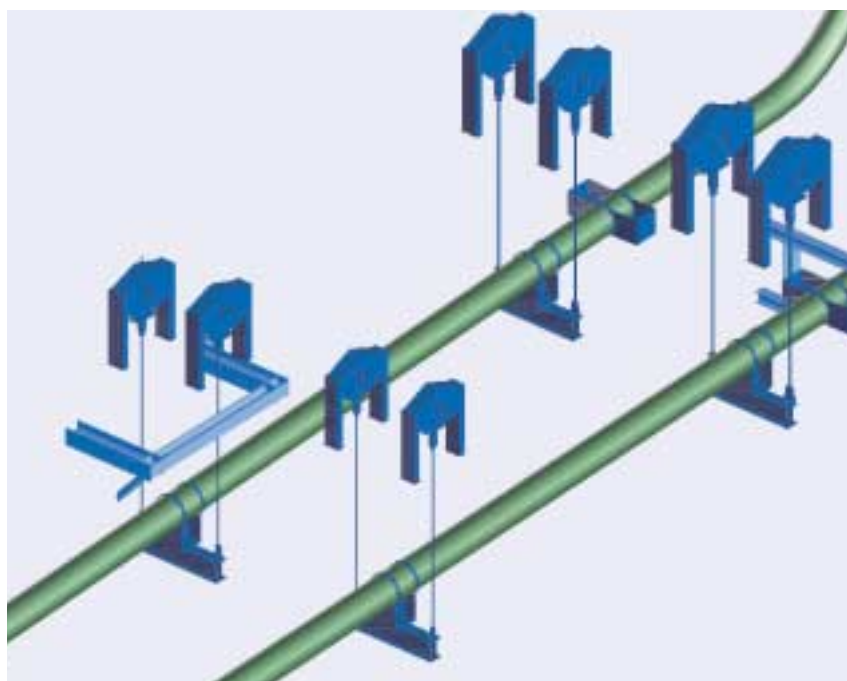
The standard LICAD drawings are automatically transposed into 3D using special data files.

LICAD saves up to 50% of planning costs

LICAD runs smoothly on any modern PC with Windows and is easy to use. Due to its particular effectiveness, LICAD has already become an indispensable tool for numerous engineering departments when designing supports. Potential cost savings of **up to 50%** simply cannot be ignored!



Location plan with axis markings and dimensions



Detailed display in 3D models

The ideal task when designing pipe supports is to connect a pipe directly to the existing plant structure. However, due to the given support positions, in most cases the existing plant structure does not allow a suitable connection. The support designer is then required to plan additional secondary steel, so-called auxiliary structures.

Standard supports

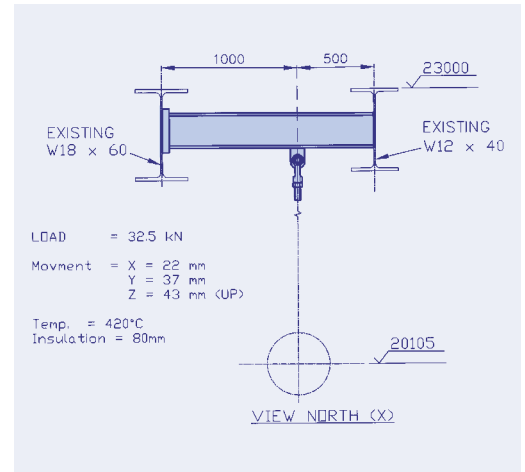
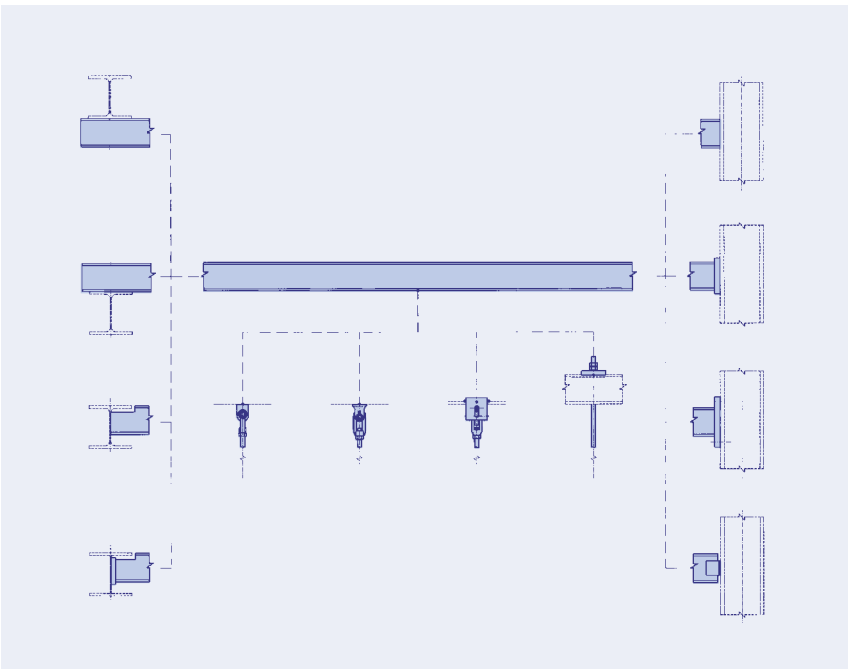
With LICAD, the most appropriate support configurations in each case are determined, then the corresponding standard supports in all their individual elements selected. A support drawing, parts list and 3D model can all be automatically generated using this system. If the standard supports cannot be connected directly to the existing plant structure, the next step is to use additional steel elements for the necessary adaptation.

Planning secondary steel

Although this steel may consist of only 1 or 2 items, each design is invariably unique, its manufacture being both labour-intensive and costly using traditional techniques. Creating the design and producing a drawing and a bill of materials with the cut lengths and economic load calculations requires a significant amount of time, even for simple designs.

With EASYSSTEEL, LISEGA has now developed a powerful tool to reduce this time to a minimum and improve the quality of the design process. At the same time it ensures interface compatibility for electronic integration. The new LISEGA EASYSSTEEL design program is a logical complement to the LISEGA modular system and the LICAD program.

Selected beam with different attachment and connecting options



Concept sketch

The program can be used either independently or in conjunction with data imported from a LICAD file. The user is guided menu-controlled through the design process, using easy selection screens.

EASYSSTEEL provides the user with the most frequently used forms of steel designs as basic elements. The most common connection types are also supplied. The user selects the appropriate design shape from the corresponding selection screens and puts in the relevant dimensions and interface data. The program then suggests beam sizes that are compatible in dimension and loading with the LISEGA attachment component. A further feature is the possibility of adaptation to the surrounding structure. After the user has decided on the preferred section size, the program generates a true to scale drawing with bill of materials and cut list.

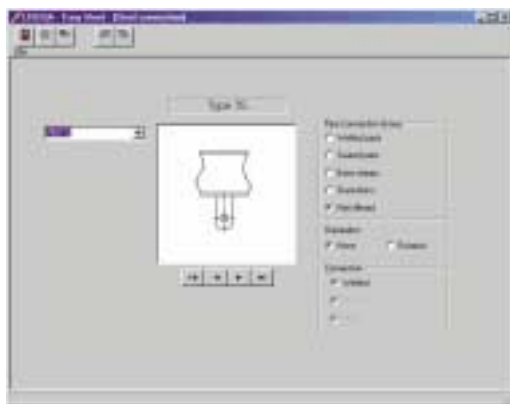
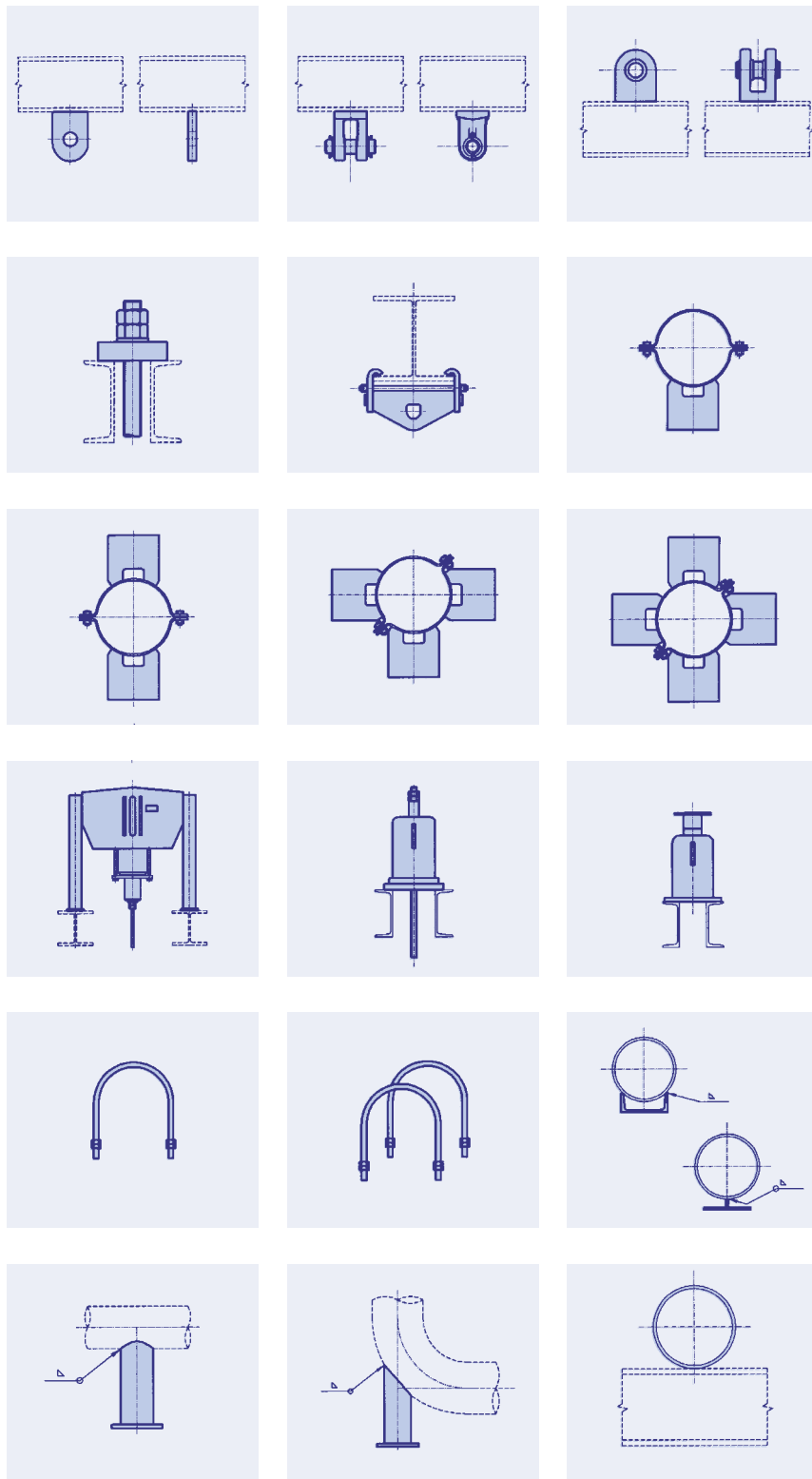
For the design elements available, EASYSSTEEL contains a series of load capacity data bases. The information needed for the design-related selection of frame elements regarding weld sizes or bolt dimensions can be found here.

SPEZIAL FEATURES OF THE PROGRAM

Connection of the pipe support to the secondary steel

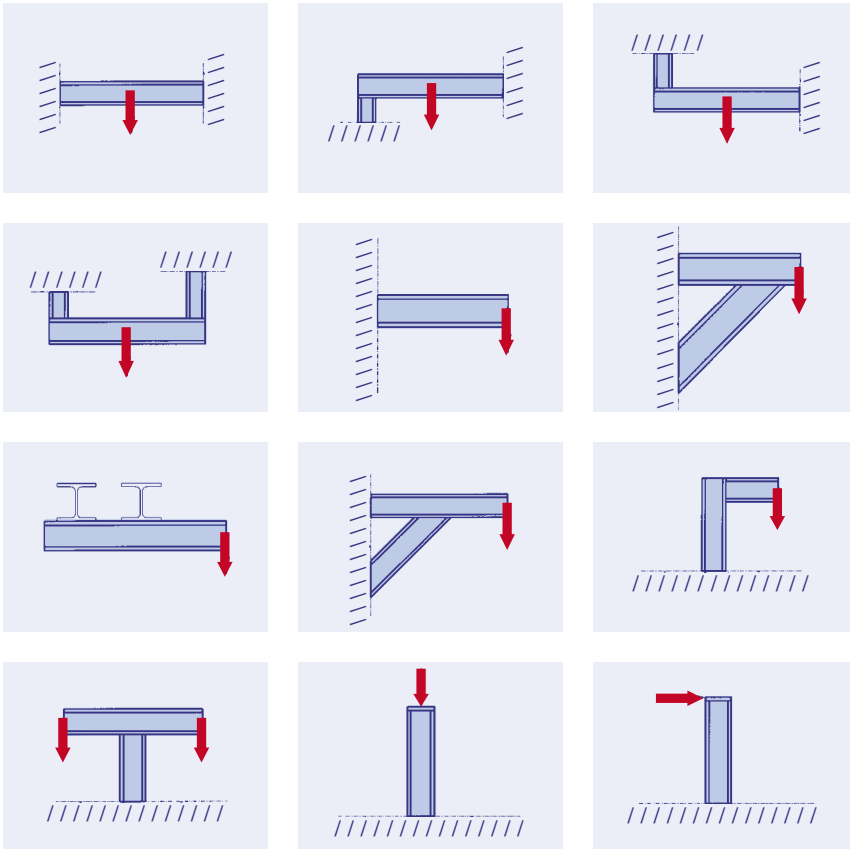
All LISEGA standard elements that can be attached to the secondary steel are included as an option, e. g.:

- weld-on eye plates, weld-on clevises, types 73, 75
- weld-on brackets, type 35
- spherical washers, beam clamps, types 74, 78
- clamp bases, type 49
- constant hangers with supports, constant supports, types 11+71, type 16
- seated spring hangers, spring supports, types 25, 26, 29
- U-bolts, type 40
- weld-on pipe shoes, stanchions, types 57, 58
- roller bearings, types 51, 52, 53
- beam adapters, type 76



Selection screen for support attachment

Available options among the LISEGA standard pipe support connections



Standardized beam arrangements

Beam systems

The program allows the selection of beam arrangements most commonly used for secondary steel designs as standard:

- beam between two existing structures
- cantilever types
- post types

Loading of beams is possible from above or below.

Section sizes

The program uses virtual section sizes and covers a sufficiently wide range of commonly used beam sections for various countries.

The list of programmed beam sections considers American, European, Japanese and Chinese standards. After determination of a range of suitable steel sizes the designer can decide which national standards shall be used to generate the drawings.

Due to the modular program, and the use of virtual section sizes, further specific national standards can be included.

This system allows the flexibility to design independently of specific national standards.

American Profiles USA	European Profiles D, F	British Profiles GB	Height x Width approx.	Internal design.
Sections (Channels)				
C4x7.25	U100	C102x51	100 x 50	SC10
...
C12x30	U300	C305x102	300 x 100	SC30
Wide flange sections				
W4x13	HEB100	2*(C102x51)	100 x 100	SH10
...
W12x79	HEB300	UC305x305	300 x 300	SH30
Small flange sections				
W6x9	IPE140	UB127x76	140 x 75	SI14
...
W14x38	IPE360	UB356x171	360 x 170	SI36
Angle sections				
L2x2x0.25	L50x6	L50x50x6	50 x 50	SL05
...
L4x4x0.375	L100x10	L100x100x12	100 x 100	SL10
Square hollow sections				
TS3x3x0.25	SHP80x6.3	TS80x80x6	80 x 80	SQ08
...
TS8x8x ³ / ₈	SHP200x10	TS200x200x10	200 x 200	SQ20

Ranges of selected section sizes

How the program works

The program is database driven, working with load capacity tables to determine the correct section, bolting and weld sizes. The concept allows the addition of other national section standards.

Codes and regulations

The permissible load values used to select beam and weld sizes are based on commonly recognized steelwork codes such as AISC, BS, DIN. Additionally, user specifications can be defined and considered during the selection process.

All relevant data can be entered in one step



USE OF THE PROGRAM

User input

The program requires the following inputs:

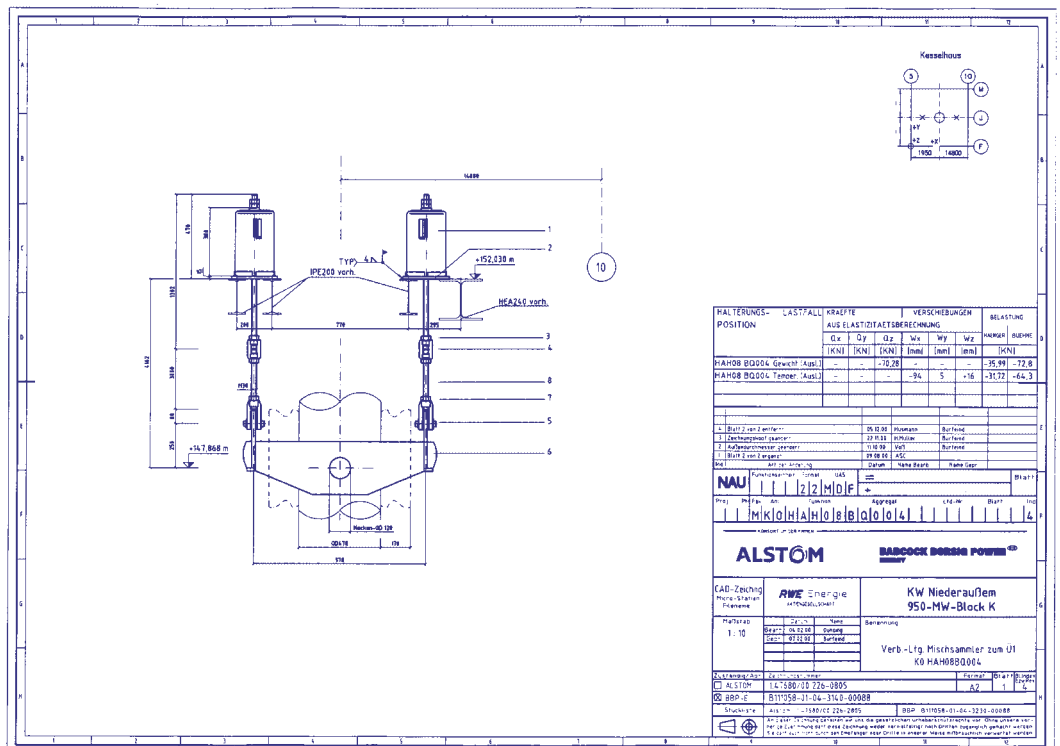
- type designation of the attachment part
- operating load acting on the beam
- notation of the connection point

This input can be taken directly from the LICAD file.

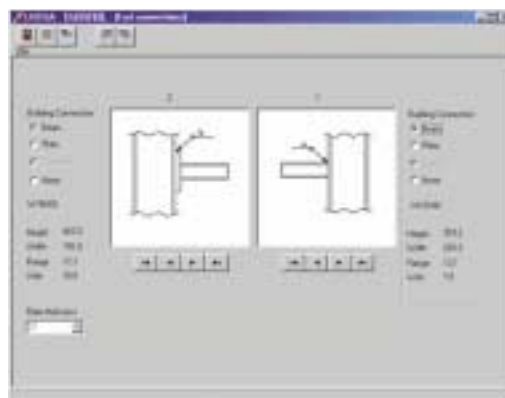
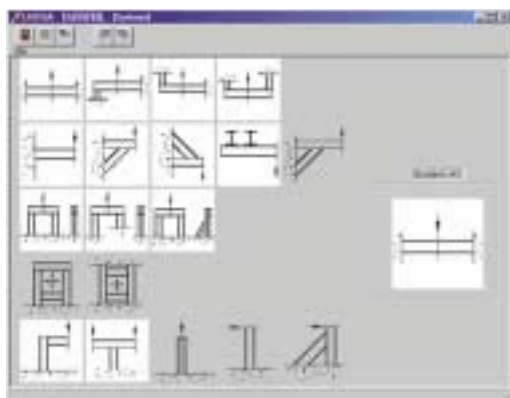
Four continuous screens guide the user in defining:

- positioning of the attachment
- the beam system
- the necessary length information
- the type of connection to surrounding structure

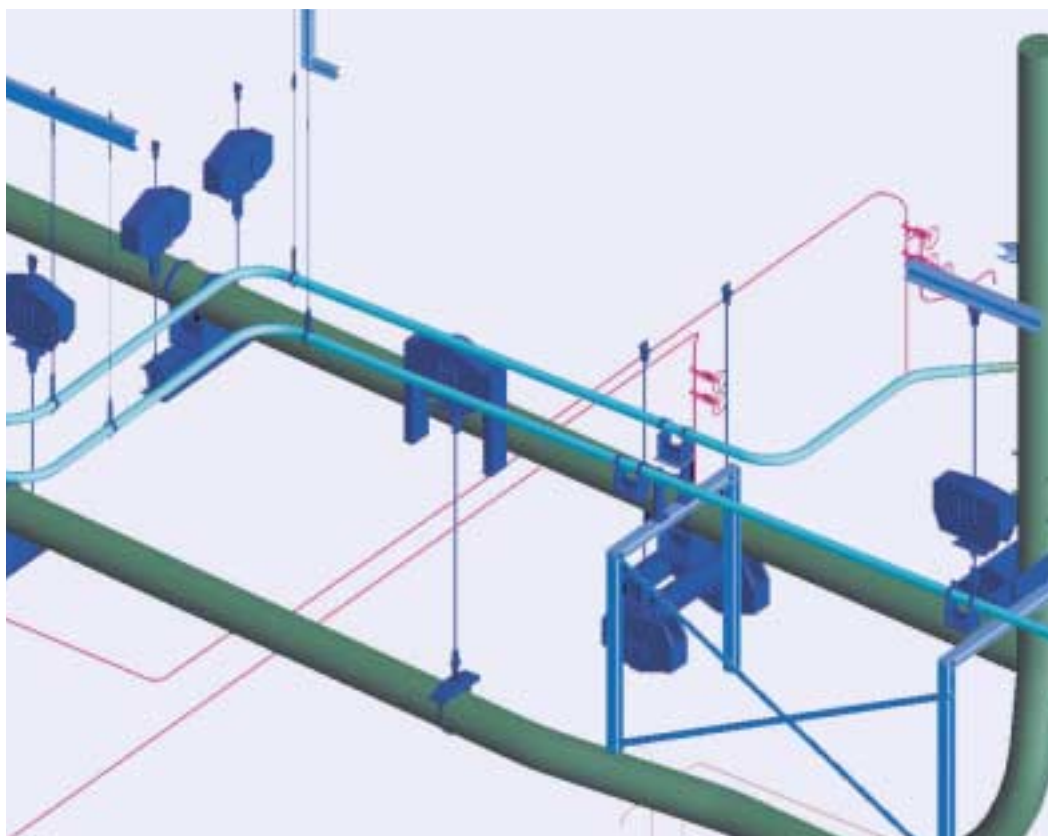
The scaled drawing includes all dimensions and the bill of material. The weld sizes are shown according to requirements in throat thickness (mm) or leg length (inch). The language desired can be selected from a range of the most common languages.



8



A logical menu follow up guides the user through the design process



COMPONENT LIBRARIES

INTERGRAPH
Process & Building Solutions



INTERGRAPH



Component libraries

For further design in the 2D and 3D fields, LISEGA component libraries are available for the following CAD programs:

- **AutoCAD, Autodesk**
- **PDS, INTERGRAPH**
- **PDMS, CADCENTRE**
- **SUPPORT MODELER, Pelican Forge Corp.**
- **NAVISWORKS, LightWork Design**

The LISEGA catalog items (Standard Supports 2010) are available both as text and database files.

INTERFACES

2D application

Via a DFX export file, the support design incl. dimensions can be transferred, with bills of materials, location plans and letter heads as an option, to CAD programs, e.g. **AutoCAD** or **MicroStation**.

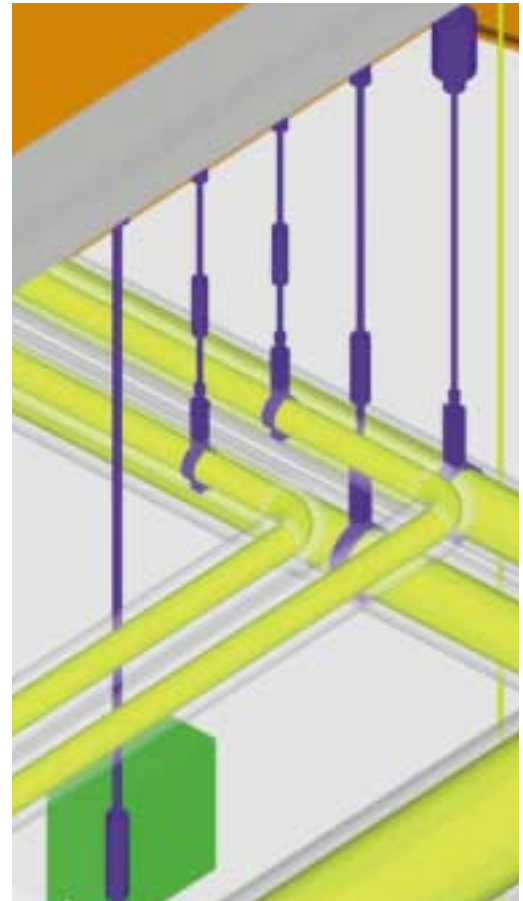
3D application

Via defined interfaces, the LICAD support designs can be transferred true to scale and without additional effort into the leading CAD programs. Using the component libraries as a basis, the standard CAD drawings can be converted to 3D in the respective CAD programs. Among others, this is possible with:

- **PDS, INTERGRAPH**
- **PDMS, CADCENTRE**
- **SUPPORT MODELER, Pelican Forge Corp.**
- **NAVISWORKS, LightWork Design**

Updates

LICAD, EASYSSTEEL and other software packages are being constantly updated and expanded. The respective valid program versions and interfaces can be downloaded from the LISEGA homepage. The necessary license numbers are thereby issued to the user via e-mail as an automatic function. Additional numbers can also be supplied by phone.



NAVISWORK 3D Design Viewer

In partnership with LIGHTWORK DESIGN in the UK, LISEGA has created an economical and easy to utilize 3D design system for pipe supports. NAVISWORKS ROAMER is a proven 3D design review program independent of any CAD design package. It contains all the functions that a support designer requires to check a 3D plant model, the main features being:

- navigation, communication and interaction in real-time with very large 3D models on a desktop or laptop computer.
- interface to MicroStation (incl. PDS) and AutoCAD formats (incl. AutoPlant).
- speed and ease in locating key components.
- snap-on measuring tool with the ability to copy and paste dimensions into LICAD.
- Fast Open GL graphics, enabling the quick and easy real-time navigation and viewing of very large models.
- ease of use – non-CAD-trained staff can efficiently use the system after minimal training.
- interference check (Clash Detector) module available.
- export of JPEG and AVI files for transmitting design review information (pictures).
- QA enhanced by access to a single model with up to date model description.
- lifetime record storage of support information with reduction in lifetime maintenance costs using as-built model.

Users can import 3D plant models from MicroStation and/or AutoCAD. 3D pipe support models (generated in LICAD) can also be imported. LISEGA customers have the opportunity to use a full working version of the program for a 15 day trial. The program can be installed from the LISEGA Multimedia CD. Specimen models are also included on the CD. If the program is required for only one project, a program copy can be obtained through LISEGA licensed only for this project.

