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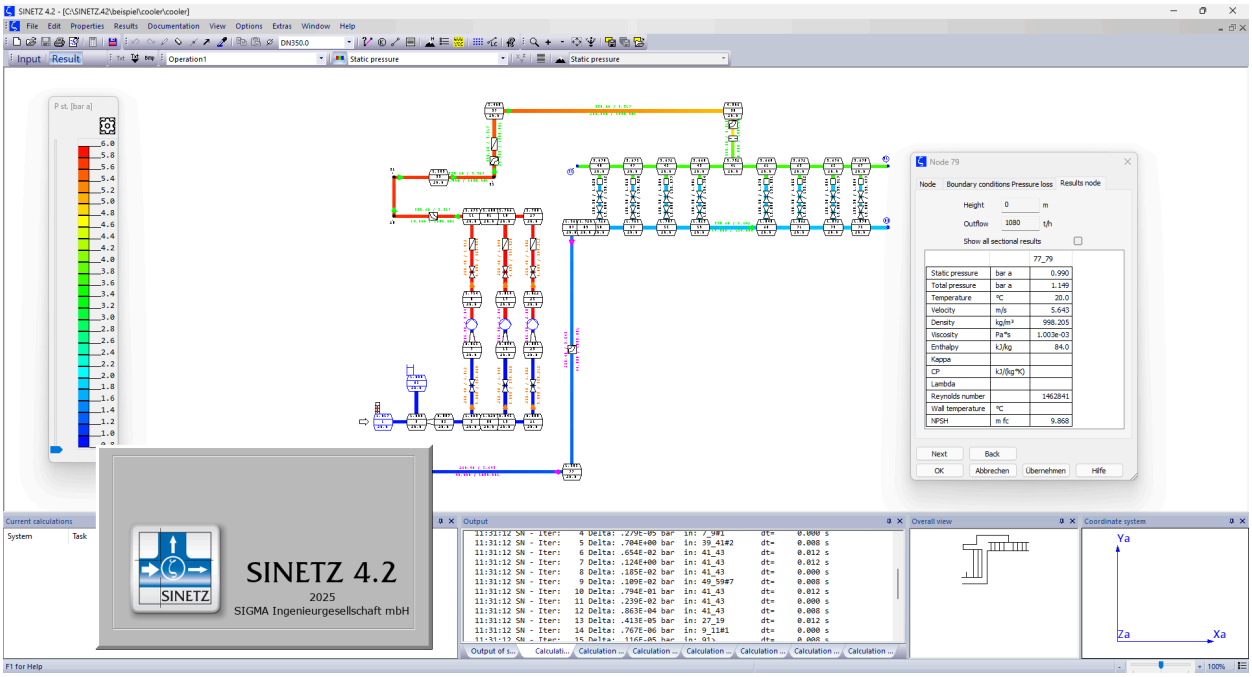

SINETZ

Steady State Calculation of Flow Distribution, Pressure Drop and Heat Loss in Branched and Intermeshed Piping Networks for compressible and incompressible media

SINETZfluid - Flow Distribution and Pressure Drop of incompressible Media

SIGMA Ingenieurgesellschaft mbH

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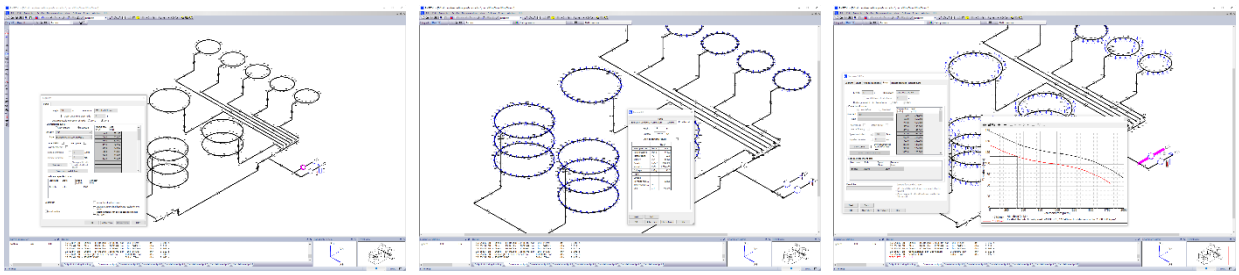
1 The SINETZ program system

SINETZ Steady State Calculation of Flow Distribution, Pressure Drop and Heat Loss in Branched and Intermeshed Piping Networks for compressible and incompressible media



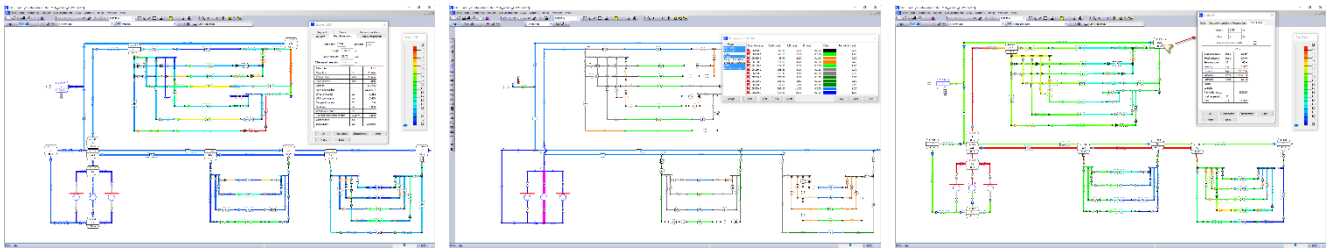
The tasks of SINETZ are

- Dimensioning of cross sections and insulation in the project period
- Dimensioning of pumps
- Verification of dimensions for network expansions
- Usability analysis of existing piping networks
- Simulation of different operation states or abnormal occurrences in intermeshed piping networks

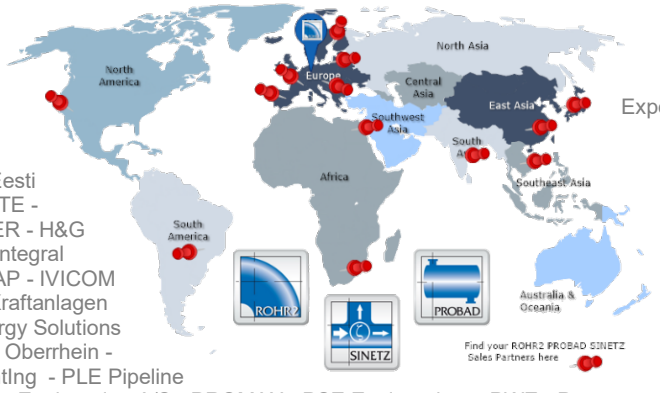
SINETZ solves the tasks by calculation of pressure and temperature loss in branched and intermeshed piping networks with circular, rectangular as well as any cross sections, defined by the hydraulic diameter.

SINETZ calculates direction of flow, rate of flow and temperature loss for individual pipe sections, as well as the temperature and pressure of individual nodes, and the resulting flow distribution for an intermeshed system of any complexity. Calculations for compressible and incompressible media are both possible.

The calculation is carried out for a given system assuming a steady state flow.
Arbitrary intermeshed networks are solvable. Calculation is possible for open as well as for closed systems.



Many well-known companies from different industrial branches trust in the quality of SINETZ, among them leading plant construction companies, power station enterprises, local energy supply companies, shipbuilding companies, ventilating system manufacturers, chemical industry, component manufacturers and universities



Expert

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The programs SINETZ and SINETZfluid are subject of this program description. The features of SINETZfluid are identical to SINETZ except of compressible media and temperature loss analysis (see exceptions in the text).

SINETZfluid

Different from SINETZ, the capabilities of SINETZfluid do not include the calculation of compressible media and temperature loss analysis.

Software Development, Sales and Support

SIGMA as one of the leading engineering specialists in the Pipe Stress Business offers ROHR2, PROBAD and SINETZ: field tested software products, strongly adapted to the user´s needs.
SIGMA engineering division is known as a partner of choice offering consulting services for plant engineering, chemical industry, engineering companies, energy suppliers and technical security boards.

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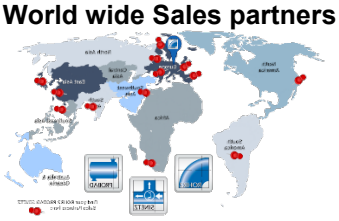

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2 SINETZ Program version and scope of delivery

2.1 Program versions and modules

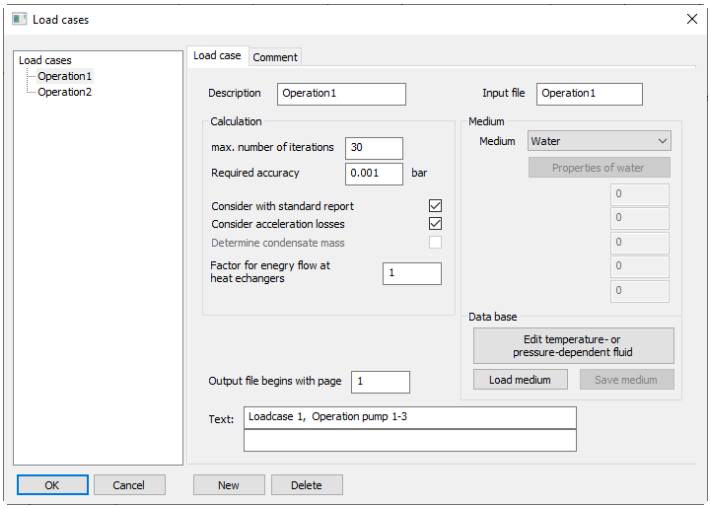
Program version	*Additional information*
SINETZ (full version)	
SINETZ is a program for Steady State Calculation of Flow Distribution, Pressure Drop and Heat Loss in Branched and Intermeshed Piping Networks for compressible and incompressible media	Program features
SINETZfluid	
SINETZfluid: features similar to SINETZ except of the analysis capabilities: calculation of compressible media and temperature loss analysis are not included	Feature reduced program version: see Program features
Included SINETZ interfaces	
For easy communication with CAD system the standard package of SINETZ /SINETZfluid includes • the SINETZ 2D Neutral Interface (NTS) for the import of 2D data (e.g. ROHR2) • the SINETZ 3D Neutral Interface NTR) for the import of 3D data and files from optional available CAD/(CAE interfaces • DXF import and export • CSV import	*SINETZ internal interfaces*
Optional SINETZ interfaces	
Optional interface modules enabling communication with CAD systems are available for SINETZ as well as SINETZfluid	*SINETZ optional interfaces*

3 SINETZ - Input of the piping system, results and documentation

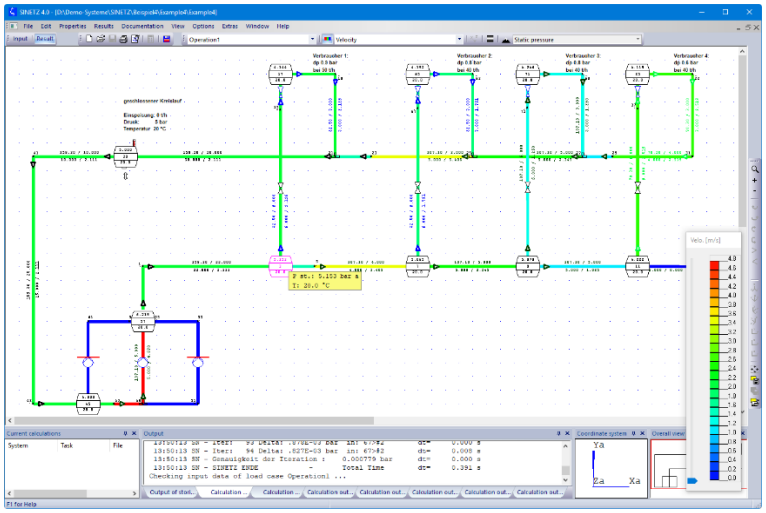
The **SINETZ** graphical user interface is the pre- and postprocessor where all inputs are made.
A wide range of control functions enables the user to check the input data easily. All results can be displayed and checked, reports are generated.

For a detailed presentation of a SINETZ Project please refer to the document: SINETZ tutorial.

3.1 System and load case input

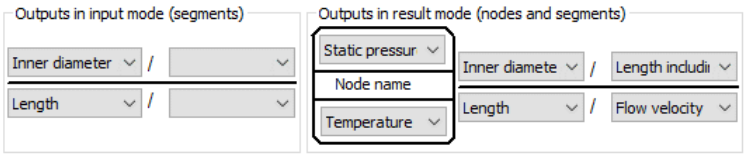


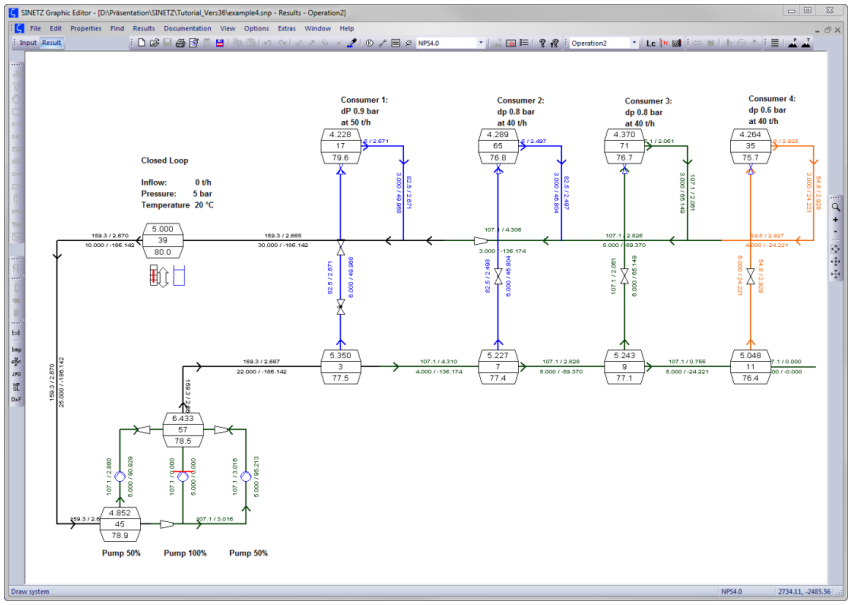
The system has to be divided into pipe sections. A pipe section consists of a pipe segment with a constant diameter without branches. The calculation parameters are entered by means of a graphical interface. The system geometry is drawn by the mouse, additional values like segments lengths, node height, components and boundary conditions are added by dialog windows and mouse input.
The program user is supported by integrated expandable databases. The program determines the resistance coefficients for some components basing on the geometry and flow state.
The inputs are shown graphically including different symbols for instruments. Additionally symbols of instruments and vessels can be defined and stored in the component database.
Various operating states of the system may be simulated by load case input.
Critical levels (treshold), e.g. for the flow velocity, can be defined to be used in the results representation.
Nearly any result distribution can be shown in colors.



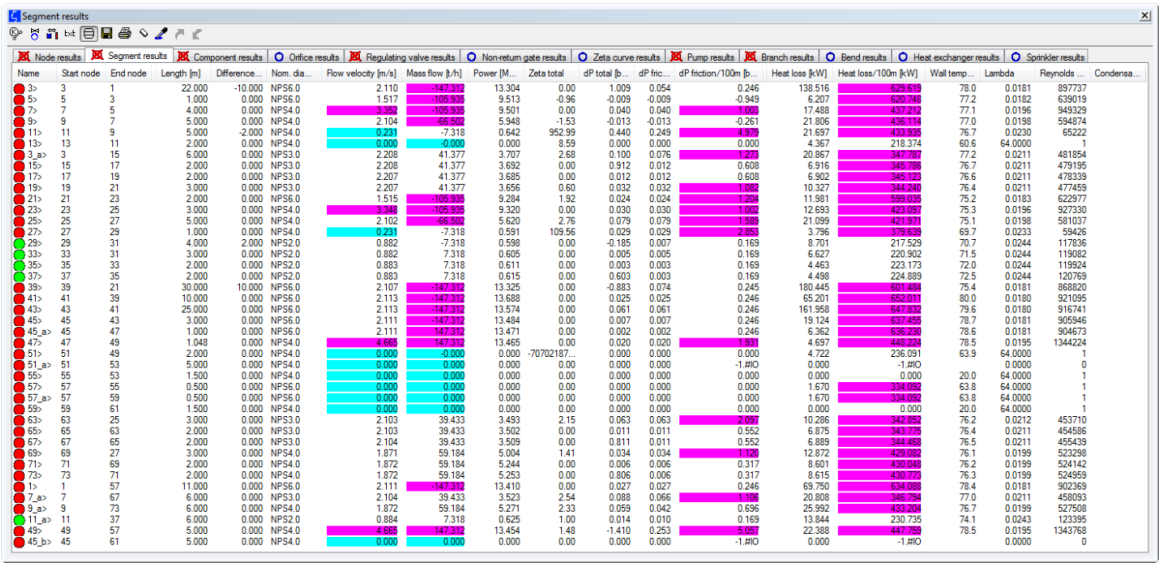
3.2 Results output - Documentation of the results

The calculation output is shown graphically and in tables. The result parameters to be shown in the graphic can be selected manually. Detailed results are shown by a double-click on the node or segment.
For documentation purposes the output files can be exported in rtf and pdf format including user defined headers and footers.

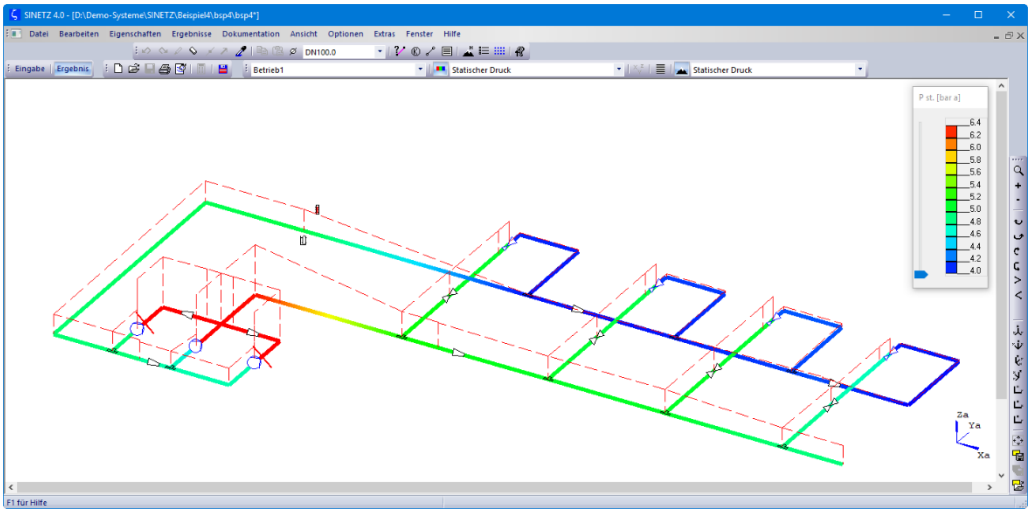




Alternatively the results can be shown tabular. Exceeded values are highlighted there.

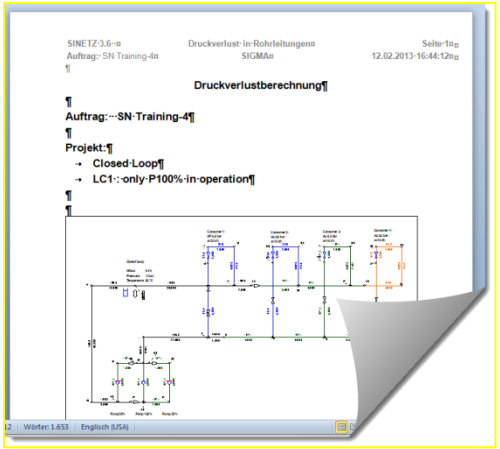


Pressure and temperature curves are shown graphically.



SINETZ standard documentation/ SINETZ report

In input mode as well as in results mode a SINETZ report can be generated including all inputs and outputs On the basis of a standard format file the input and output tables are created directly by the input tables and results of the current project. The SINETZ templates can be adapted to the user´s needs. After revising the calculation the report is updated automatically.



SINETZ report

Additionally output files may be exported into rtf and pdf format including user-defined headers and footers for documentation or reports

4 Program features

General

- SINETZ calculates models with up to 15.000 pipes and up to 15.000 nodes.
- SINETZ allows the parallel definition and calculation of several load cases which reduces the calculation time significantly in many cases.
- Plausibility of input data is checked and detailed error messages are provided
- An online help is available

System input

Units

- Selectable unit for flow input/output of various mass flows may be m³/h, kg/s or t/h.
- Selectable unit for pressure can be bar, mbar and Pa (pre-defined).
- Any units can be defined by the user

Handling

- Pre-definied settings for new projects
- Individual assignment of mouse functions like zoom, pan and rotate
- UnDO and ReDO functions
- A context menu allows to access often or last used commands
- User-defined shortcuts can be defined

Geometry

- Design of 2D- and 3D-Models.
- Import of piping models from CAD systems (see chapter 5, interfaces)
- Graphical input of the entire pipe network by mouse. Additional parameters like segments lengths, node heights, components and boundary conditions inserted in dialog windows or selected by mouse.
- DXF import, CSV import
- Any cross sections of pipes may be analyzed. At circular or rectangular cross the outer diameter and wall thickness are entered (or height and width, inside). Other cross sections require the input of the hydraulic diameter and the equivalent circular diameter.
- Alternative editing of data in lists.
- Automatic creation of node and segment names (may be changed by the user).
- Pipe names can be assigned to segments.
- Pipe names may be used for assigning data and checking input parameters.
- Regions can be defined and named, e.g. „existing system“, „news system“. Segments may be assigned to several regions.

Zeta values, components

- The zeta value at reducers/expansions, orifices, branches, tees, y-pipes and bends can be determined by the program and must not be entered by the user. The zeta value is calculated basing on the geometry and the flow state.
- Resistance values at instruments/ components may be inserted as zeta- or k_V -values. The Zeta-values/ k_V -values are represented by symbols.
- Different symbols for the representation of instrument are available.
- Zeta values of instruments may be taken from a user expandable database.
- If the norm zeta values in the database depend on nominal diameter, the norm zeta value of an instrument is adjusted automatically after changes in dimension.
- Non-return valves with given flow direction may be inserted. Depending on the flow direction the program opens or closes the gate.

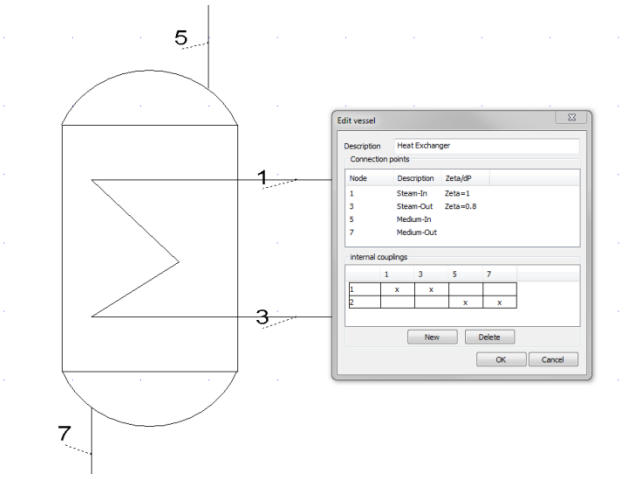
- Pressure reducers with a defined outlet pressure can be inserted.
- Zeta values can be defined independent of velocity, volume flow or mass flow.
- Regulation valves can be defined by the given mass flow

Pumps/ fans

- Pumps /fans are defined by their curves and shown by symbols.
  The pump curves can be taken from the user expandable database.
- Pumps /fans can be activated d depending on load cases.
- Pump speed and impeller diameter can be inserted depending on load cases. The pump curve is adapted to the load case by iteration.
- The NPSH value at pumps is checked automatically if the required parameters have been defined at the pump input.
- For speed-controlled pumps, the required pump speed can be determined by specifying the desired operating point.

Vessels

- Vessels with individually defined connection points can be placed into the model. Each connection point can be completed by an additional zeta value.
- The internal connection between connection points can be made individually. This can be used for example to simulate two independent circuits inside a heat exchanger.



Insulation

- Input of the insulation of free-laid pipes and buried pipes with circular cross section.
- A temperature depending coefficient of thermal conduction can be entered for the insulation
- The coefficients of thermal conductivity can be defined for pipes, insulations, insulation jackets and for the soil at buried pipes.

Various inputs

- SINETZ enables to insert sprinklers into a piping system.
- Resistance and back pressure can now be specified for nozzles (sprinklers) as an alternative to the sprinkler constant

Graphical representation

- Various text and graphic files (*.jpg, *.bmp, metafile, or *.dxf) can be inserted for documentation purposes
- Texts can be assigned to groups. Control visibility of text groups
- Descriptions of nodes and segments are shown as individual text blocks
- Insertion of a background image. It can be used to generate a piping model by tracing a scaled isometric
- By means of a symbol editor program additional symbols can be created and stored in a database. Zeta values can be added to these symbols, too.
- The symbol editor module enables to add vessels with individually designed connection points can be created and stored in a database.

Load cases - Operation states, Boundary conditions

Simulation of different operation states in the system. Each operation state requires the definition of one load case. One medium per load case is defined.

- Pressure, temperature, medium, inputs and outputs can be entered load case dependent to simulate various operation states. under the condition that the system is not over- or under determined
- Pumps and fans can be switched on/off depending on load cases
- Load case dependent input and output of energy flows at nodes.
- Resistance coefficients or pressure drop at components/instruments may be entered load case dependent. This is used to cut off parts of the system for the simulation of various operating states.
- Load case dependent input of environment conditions like wind velocity, ambient temperature or soil temperature.

Databases

Databases may be edited by means of dialog windows or by an ASCII-Editor.
The following data can be taken from SINETZ databases:

- Pipe dimensions
- Reducer dimensions
- Pipe texture
- Insulation data
- Zeta- /k_V -values of instruments
- Pump curves, fan curves
- Gas values (gases and gas mixtures)
- Media

A mass import function by csv files is available for pump data.

Available dimension files can be stored as templates. This is used to define frequently used dimension records (e.g. from piping class) for further use in new projects.

Media

The following list of media is available:

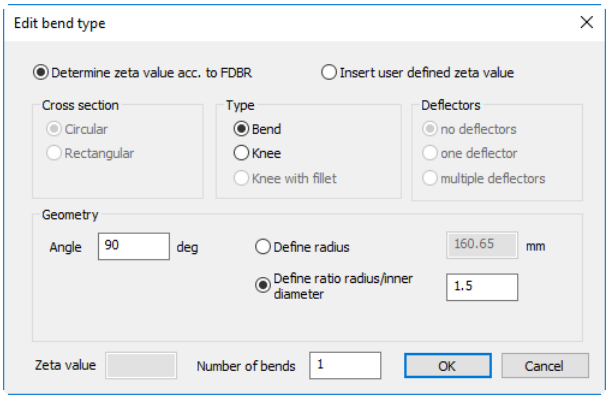
• Water	The steam table acc. to IAPWS 1997 is implemented
• steam	The steam table acc. to IAPWS 1997 is implemented
• Constant fluids	Requiring input of constant specific heat capacity, medium density and viscosity
• Temperature depending fluids	Requiring input of temperature depending specific heat capacity, density of the medium and viscosity
• Pressure depending fluids	Definition of fluids with pressure depending properties
• Any gases	Input of Gas constant, special temperature capacity at constant pressure or isentropic exponent, dynamic viscosity or real gas factor required
• Gas mixture	Any mixture of gases from the database
• Flue gas	mass fraction of water and CO_2 req.
• Air	
• Helium	
• Methane	
• Nitrogene	

Different from SINETZ, in SINETZfluid only water and fluids are available media.

Calculation

- Intermeshed networks of any complexity are analyzed.
- Any cross sections are calculated.
- The numbering of networks and advance estimation of quantity injection is carried out by the program.
- The discretization of segments for the analysis of compressible media is done by the program.
- Pumps and fans are calculated using their characteristic curves.
- Addition of several zeta-values per segment.
- Zeta-values at right angled and sloping branches and runs are calculated by the program. Fillets are considered.
- Component Y-PIPE: the zeta values are determined by the program
- Resistance coefficients of bends, reducers and expansions are determined.
- The analysis of zeta values at bends has been extended:
  - Zeta values at bends in pipes with rectangular cross sections are determined automatically
  - Zeta values at bends with deflectors are determined automatically
  - Zeta values at bends may be defined by the user

- Zeta values of orifices with defined openings are calculated according to EN ISO 5167-2:2003 and FDBR standard
- Orifice dimensioning acc. to EN ISO 5167-2:2003



- Zeta values of perforated plates can be calculated in accordance with FDBR standard
- Zeta values of regulating valves are determined iteratively for a given mass flow.
- Zeta values of non-return valves are iteratively determined by the given flow direction

- Calculation of the compressibility factor depending on pressure and temperature in gas mixtures (not for SINETZfluid).
- Heat loss across pipe insulation is considered for buried and free laid pipes acc. to DIN EN ISO 12241 (not for SINETZfluid).
- Heating-up of the medium through insulation (if outside temperature > medium temperature) is considered (not for SINETZfluid).
- The mass flow of fluids is determined iteratively at heat exchangers due to energy flow and output temperature (district heat piping)
- Calculation of condensate quantity at heating up (by approximation) and in stationary operation case (not for SINETZfluid)
- Function for optimizing pipe measurements
- Extended documentation options

Results, Documentation

- Output of the results in English or German.
- All results are shown graphically and in tables. An output file in ASCII format is created.
- The input of an alternative company logo or text field makes it easier to work on commission orders.

Graphics

- The graphical representation of the results at nodes and segments may be controlled by the user.
- Parameters of nodes and segments to be shown in the graphic can be selected by the user.
- Results at nodes and segments can be shown as a tooltip using the properties commands. The content to be shown can be defined by the user.
- Critical velocities are represented in colors.
- Critical parameters like flow velocity, mass flow, pressure drop or heat loss can be represented in results tables.
- Graphical representation of node heights
- Graphical representation of pressure curve
- Show any result of node sequences in a graphic chart. Also the representation of several types of results in one diagram, e.g. static pressure and total pressure, is possible.
  Results diagrams can be part of the standard documentation as well as of the user defined calculation report.
- Graphical representation of temperature curve.
- Output of the graphics on printer or large-format printer (plotter), into the clipboard or into the file formats metafile or DXF.
- Pipelines, individual views and regions can be printed on single sheets pf paper

Documents, tables

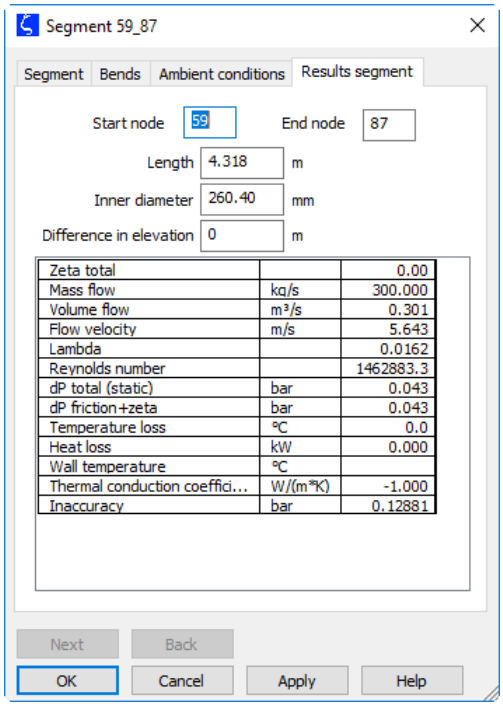
- SINETZ includes an automatic report generation.
  The SINETZ report generation module creates a calculation report including input data and results on the basis of factory templates or user defined samples including input data and results
- Export of output files in pdf or rtf format with user defined headers and footers
- The results at nodes and segments may be listed. The list may be filtered, sorted and stored in rtf, html or txt (ASCII) format.

- New report function creating a standard documentation basing on templates (factory templates) to be used to calculation reports
- Export of comprehensive calculation results to office programs (e.g. MS Word) basing on standard templates in addition to the standard output functions
- A documentation summarizing the results over all load cases for specified nodes and components

Results output capabilities

Results at pipe segments

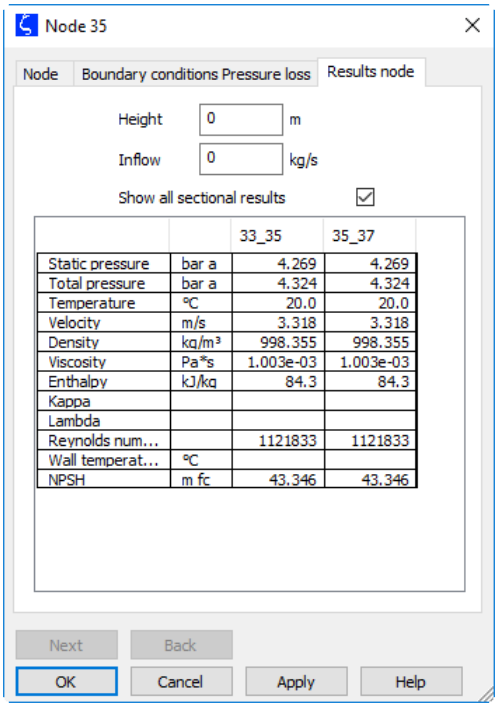
- the sum of zeta values in the segment
- flow rate and direction
- velocity
- friction coefficient Lambda
- Reynolds' number
- Changes in pressure
- Changes in temperature
- Wall temperature of the insulation (not for SINETZfluid)



Results at nodes

- Pressure
- Temperature
- Total inflow and outflow·
- Density and viscosity of the medium
- Enthalpy
- NPSH available

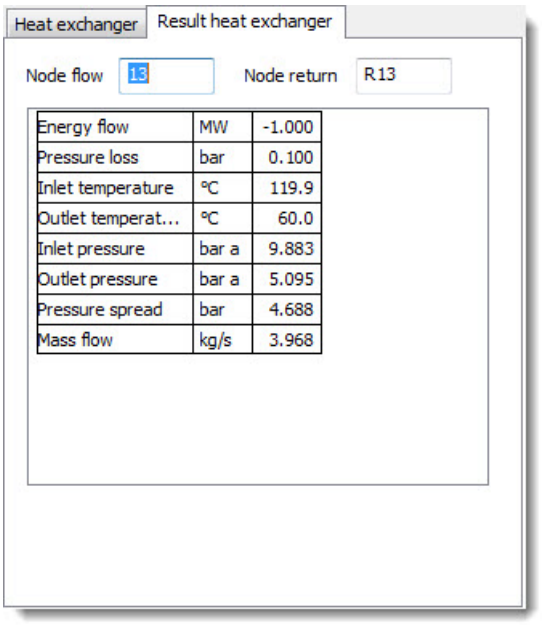
  The results also can be displayed at every segment of the node (cross sections). This can be used for the interpretation of results at nodes with velocity changes where velocity changes have an effect on the static pressure before and after the node.



		33_35	35_37
Static pressure	bar a	4.269	4.269
Total pressure	bar a	4.324	4.324
Temperature	°C	20.0	20.0
Velocity	m/s	3.318	3.318
Density	kg/m³	998.355	998.355
Viscosity	Pa*s	1.003e-03	1.003e-03
Enthalpy	kJ/kg	84.3	84.3
Kappa			
Lambda			
Reynolds num…		1121833	1121833
Wall temperat…	°C		
NPSH	m fc	43.346	43.346

Results at heat exchangers considering the analyzed mass flow

- input pressure considering the pressure loss given by the heat exchanger
- output pressure considering the pressure loss given by the heat exchanger
- difference in pressure considering the pressure loss given by the heat exchanger
- required mass flow
- input temperature



Energy flow	MW	-1.000
Pressure loss	bar	0.100
Inlet temperature	°C	119.9
Outlet temperat…	°C	60.0
Inlet pressure	bar a	9.883
Outlet pressure	bar a	5.095
Pressure spread	bar	4.688
Mass flow	kg/s	3.968

Calculation of pressure and heat loss in district heating networks

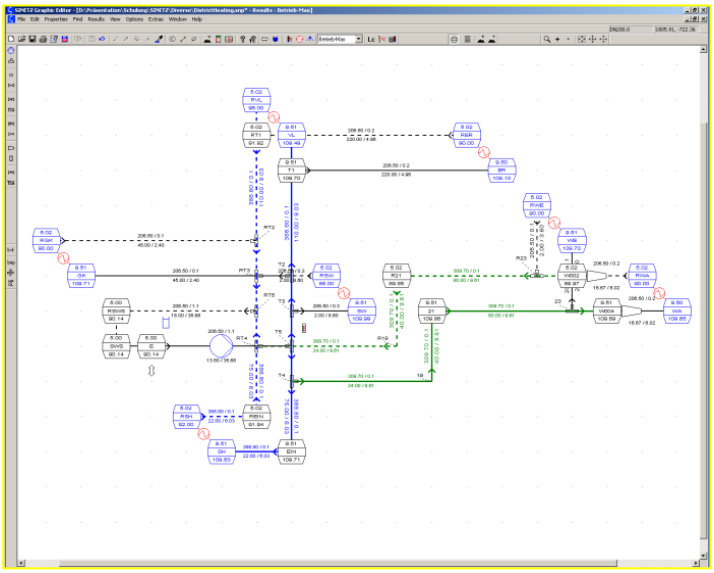
Program features

The district heating module extends the capabilities of SINETZ by several options:

- In case of incompressible media the required mass flow is calculated at heat exchangers
- The return system is created automatically basing on the parameters of the flow.
- The flow and the returning system may be shown separately.
- The input- and output pressure and temperatures at heat exchangers are checked.

Inputs and results

The inputs at heat exchangers are:
- energy flow, output temperature and return node.
To check the pressure at the heat exchanger, the pressure loss of the heat exchanger may be entered.
The program analyzes the required mass flow by means of the heat exchanger parameters and the results at the input node.
The pressure and temperature results are checked. An error message occurs, in case of not allowable pressure or temperatures.
The output file includes the results at heat exchangers.



Program version and system requirements

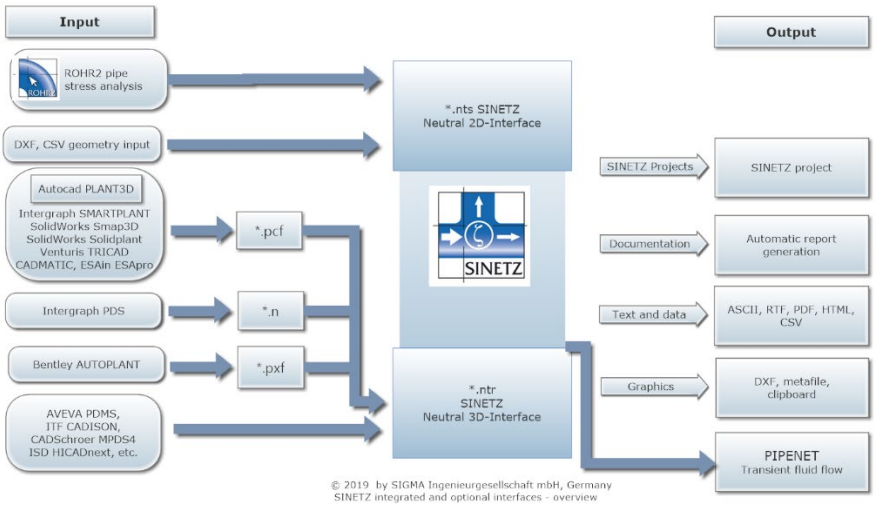
The district heating module is part of the SINETZ single user /network license.

Backup

- The automatic backup function saves the last five revisions of the piping model automatically.
- The automatic backup now is part of the project directory when storing into the subdirectory "_AUTOSAVE_"
- The backup command enables to write the project data additionally, e.g. into a network drive.

5 SINETZ Interfaces

The SINETZ interfaces are applicable for the import of data from CAD/CAE programs and for the export of calculation parameters for documentation purposes.



SINETZ available interfaces - Overview	Data format	Import / Export	Standard package	Optional available interfaces
Neutral 2-D Interface SINETZ, NTS format	*.nts	IMP	X	
Neutral 3-D Interface SINETZ, NTR format e.g. AVEVA PDMS/E3D	*.ntr	IMP	X	
DXF files	*.dxf	IMP	X	
		EXP	X	
CSV files	*.csv	IMP	X	
SINETZ CAD interface package including:				
PCF pipe component file	*.pcf	IMP		X
Intergraph SMARTPLANT via PCF	*.pcf	IMP		X
PDS	*.n	IMP		X
PASCE	*.ntl			X
AUTOPLANT/AUTOPIPE	*.pxf	IMP		X
Optional available CAE interface				
PIPENET Fluid dynamics	*.sdf	EXP		X

For the import of CAD/CAE data there is a 2D and 3D interface available.

The 3D-interface can be used for the import of data from 3D-CAD systems.

The 2D-interface is used to import P&ID data and pipe system data from the pipe stress software ROHR2. There is also the opportunity to import data from flow diagrams if a readable export file is available. Contact us regarding the optimization of your workflow and integration of CAD/CAE data into SINETZ.

5.1 SINETZ internal interfaces

Internal Interfaces (part of the SINETZ standard package)

Internal interfaces are included in the standard package and integrated into SINETZ.

Neutral 2-D Interface SINETZ, NTS format

To simplify the data import of data with 2D coordinates (e.g. flow diagrams, R+I schemes), the format of the neutral interface has been defined, basing on the listing of all elements and their parameters in the system (pipe, bend, instruments, ..)
The neutral interface is part of the SINETZ program.

Neutral 3-D Interface SINETZ, NTR format

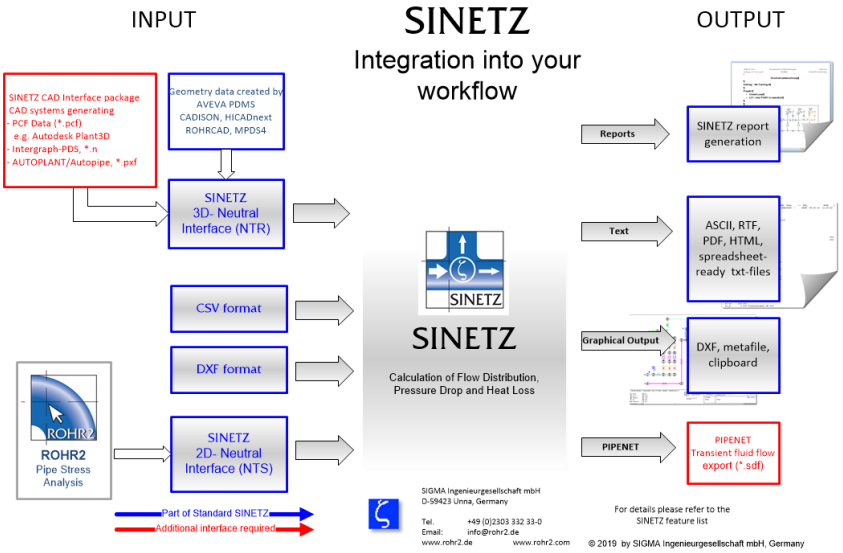
To simplify the data interchange with 3D-CAD systems, the format of the neutral 3-D CAD interface has been defined, basing on the listing of all elements and their parameters in the system (pipe, bend, instruments, ..).
The SINETZ standard package includes the import of data in NTR format using the ROHR2 interface of AVEVA PDMS/E3D.

DXF data

SINETZ supports the import and export of data in dxf format.
Generate a SINETZ model from flow sheets /P&ID schemes in DXF format (*.dxf).
All types of lines („LINE“, "POYLINE“, „LWPOLYLINE“) are used to generate SINETZ segments.
Select the layers which need to be considered.

CSV data

The interface CSV is used to convert data in text format (csv) into a format readable by SINETZ and ROHR2.



5.2 SINETZ optional interfaces

Optional Interfaces

A great number of optional available interface modules enables to exchange data with CAD/CAE systems in addition to SINETZ standard interfaces (see 5.1).

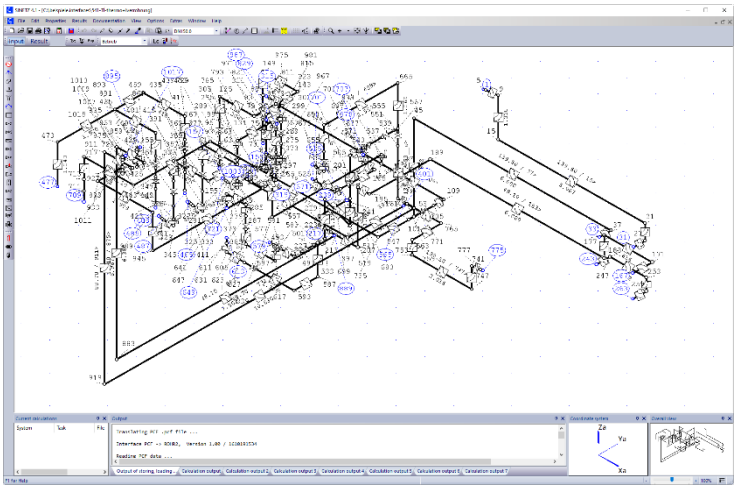
File formats currently supported by SINETZ interfaces:
SINETZ CAD interface package, incl.

- PCF format , *.pcf
- Intergraph-PDS, *.n
- AUTOPLANT/AUTOPIPE, *.pxf

SINETZ CAE interface

- PIPENET, *.sdf

The transfer from CAD systems can be carried out via PCF - SINETZ Interface (e.g. from Pro/ENGINEER, TRICAD MS, AutoCAD PLANT3D, AutoCAD Inventor, if the systems are equipped with an ISOGEN module.



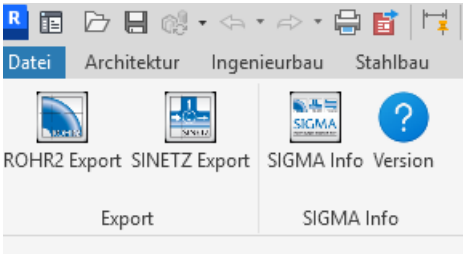
PCF file, import into SINETZ

PCF interface

The PCF interface is used to convert data in PCF format into SINETZ.
The PCF format is used by several CAD-systems to create isometrics like AUTODESK Plant3D, Intergraph SMARTPLANT or Pro/ENGINEER.
This interface is used to convert data from several CAD systems into SINETZ.
The PCF Configurator can be used to create and manage configurations for translating PCF files. The configurations are all stored in the file *pcfConfig.xml*. In SINETZ only flow relevant parameters are considered.

REVIT - SINETZ Add-in

As part of the continuous development and improvement of the integration of our software products ROHR2 and SINETZ, we have developed an add-in for Autodesk REVIT.



Intergraph-PDS N files, data import via NTR

The import of Intergraph-PDS data into SINETZ is carried out by the PDS Stress Interface.
Intergraph PDS is a CAD/CAE application for plant design and construction of Intergraph Corporation, Huntsville, AL, USA (www.intergraph.com).

Interface PASCE

Interface to transmit the output data of the PASCE Stress Interface, AEA Technology Engineering Software, into the SINETZ neutral interface format.

PXF data import via NTR

Interface to convert data from PXF format (AUTOPLANT/AUTOPIPE) into the SINETZ 3D neutral interface format.

PIPENET data export

Fluid flow calculation

Interface for the exchange of data between SINETZ and PIPENET (Sunrise Systems Ltd, www.sunrise-sys.com). PIPENET is a software tool for rapid flow analysis of pipe and duct networks and dynamic fluid hammer forces.

6 Program license, System contract

The program license is available as a single user license or network license, perpetual or rental. Licensing a program requires the acceptance of the terms of use by signing a System Contract. Contract samples are available upon request.

Single user license	The single user license allows the installation of the program on the PC-systems of the licensee and the use by means of a license key (dongle) on one PC system simultaneously.
Network license	The network license enables the access to the program system by any PC in the network, limited by the number of users.
WAN	Wide area network Option Expanding the network license by an additional location

License duration

Time unlimited /perpetual license (purchase)	Allows the **time unlimited use of the program.** Maintenance and user support are included during the first six month after delivery. In order to receive continued maintenance and user hotline, the signing of a maintenance contract is recommended.
Time limited program use (rent)	Time limited use of a program license. Minimum rental time is three month. Support and maintenance are included. Fees may be partially reimbursed in event of a purchase of the rented license(s) during the rental period.
Payment by installments (leasing)	Time limited single user program license including maintenance and support. Payable by monthly rates. After finishing rates the license will be converted into a time unlimited program version. Maintenance is included.

6.1 Scope of supply and license key

The programs´ scope of delivery contains
- the program data (by download)
- the program documentation, pdf format
- the SINETZ license key (USB dongle or Software License key)

The software does not run without the license key.
In case of updates/ upgrades the license module will be replaced or updated.

SL License key

- SINETZ 4.1and higher supports Software license keys (SL License) without USB key.
- SL Licenses are available for network licenses
- SL Licenses allows to „Borrow licenses“, I E. taking a network license access/ user off the network for a specified time period
- For details please refer to the document SINETZlicense or contact the SINETZ sales team

6.2 System requirements

The requirements of the Sentinel runtime software need to be met.
Download the software here: https://www.rohr2.de/public/sentinel_readme.zip

The system requirements of all SINETZ program versions are as following:

System requirements of single user licenses and PC-workstations in the network

- PC mit mind. 16 GB RAM empfohlen 32 GB RAM
- Windows 11/10 (64-bit)
- Screen resolution minimum 1280 x 720 px, 1920 x 1080 px recommended
- USB port (not in case of SL Licenses)
- Internet connection for the activation of the program license *) and program updates

*) Activation by phone/email or internet

System requirements of the network server

In addition to the requirements for single user licenses:
- Installation of the HASP license manager on a Server PC accessible by all users in the network
- Windows 11/10, Windows Server 2022/2019/2016 (64-bit)

In case of integrating ROHR2 into company-wide or country-wide networks (WAN) please contact us.

7 Software Services

7.1 Program maintenance and updates, User support

The program system SINETZ and the additional programs come with detailed application documentation. For any questions about SINETZ you may contact the SINETZ/ROHR2 support team to get direct advice from our hotline staff of developers and engineers. You can send the project file you are currently working on, to discuss your questions with our development and engineering team with 40 years of pipe stress analysis experience.

This direct link the hotline guarantees an effective use SINETZ and assures that you are not left alone with your problems.

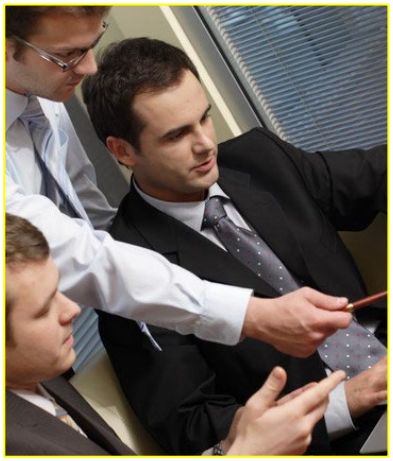
SINETZ continuously developed analysis software

Updating the software by periodical releases is an essential component of the maintenance agreement. The software is developed continuously. Updates are available by internet download.

This makes use of the software possible for the user due to the current stand of technology which is demanded by the legislator in the current norms and laws.
The programming technical development as well as the customization to technical prerequisites such as operating systems are also component of the update service. Through this a long-term safeguarding of the investment submits to software and hardware.

7.2 SINETZ trainings

In order to boost the efficiency of the SINETZ users, SIGMA proposes a concept of user trainings, which have proven their effectiveness for many years.



Possible training units are:

- Basic Trainings
- Trainings for users with experience in other pipe calculation software.
- Expert training, advanced courses
- Trainings for program updates
- Trainings to special topics on demand

Basis of the trainings may be our field-tested education examples or pipe systems suggested by the user.
Both, the theoretical part with explanation of the graphic user interface and information about the SINETZ environment as well as the practical part at the computer with working at selected examples, check of input files and evaluation of the results get an adequate time period within the course.

SIGMA trainings

Individual Program Training	**SINETZ Internet training sessions**
The small group size of 1 to 6 persons per course allows an effective personalized training. The training can be adapted to your personal need, e.g. for the clarification of open questions arising in your everyday work with SINETZ. We encourage you to bring the project examples you are currently working on and make them the subject of your training so that the questions relevant to your situation are discussed. Training language is German, English or French. Training dates may be arranged individually. Place of the training may be the trainees company office or our corporate center in Unna	In case of urgent questions or project related needs which do not justify the organization of a complete one or two-day training we propose internet based training. All you need to do is to install a local viewer client (VNC) and log into our training PC. Using the telephone line and the internet connection you will follow the training session on your screen, interact using your mouse and discuss the difficulties and questions with our training staff. You can also send your example and we discuss the problems using this example. Please call our support hotline in order to arrange for an internet training (which usually can be arranged within hours). The main benefits of Internet based training are cost and time savings.

Please contact us for an individual training offer.