

ROHR2

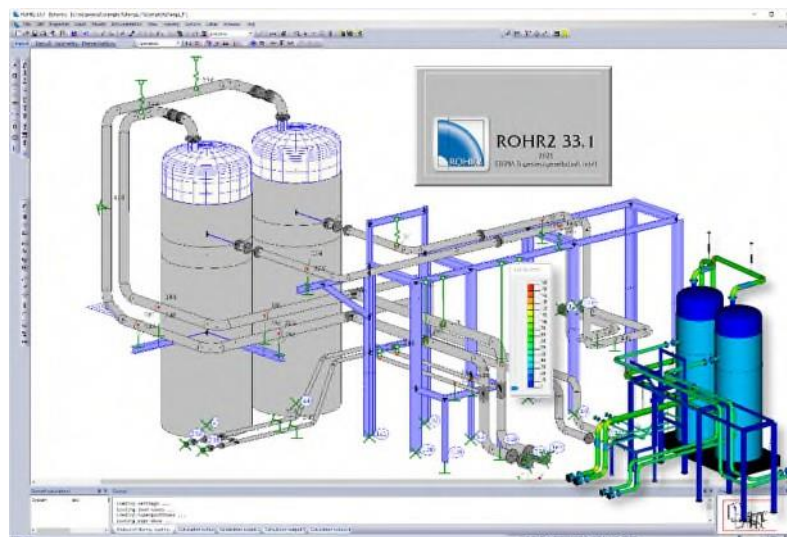
Program System for Static and Dynamic Analysis of
Complex Piping and Skeletal Structures

ROHR2 33.1, April 2021 New Features and Improvements

The program system ROHR2 with its additional modules is checked and modified continuously within the scope of the maintenance agreement.

The program release ROHR2 33.1 replaces the ROHR2 33.0.

This document shows the improvements and enhancements of the program release ROHR2 33.1:



Overview

- New control functions for the generation of standard views were implemented. This allows to organize the standard views.
- A new component „single use expansion bellow“ for distributed heating systems was introduced.
- Copy and Paste of system parts with substructure now work across systems.
- The difference movements between jacket pipe and inner pipe are now included in the list functions.
- Import of pipe classes from PROBAD is now possible.
- ROHR2 includes new versions/revisions of stress codes and databases.

Contact information

SIGMA Ingenieurgesellschaft mbH
Bertha-von-Suttner-Allee 19
D-59423 Unna

www.rohr2.com

SKIOS Engineering AB
Trefasgatan 1
SE-721 30 Västerås

www.skios.se

ROHR2 33.1, Modifications and Improvements in detail

Update of stress codes

Title	Content, keywords and source	Edition
EN 13480	DIN EN 13480-3 Metallic industrial piping - Part 3: Design and calculation; German release DIN EN 13480- 3:2017-12/A2:2020, A3:2020	2020
EN 13941	Design and installation of pre-insulated bonded pipe systems for district heating	2019
ASME B31.1	Power Piping ASME Code for Pressure Piping, The American Society of Mechanical Engineers, New York	2020
ASME B31.3	Chemical Plant and Petroleum Refinery Piping ASME Code for Pressure Piping The American Society of Mechanical Engineers, New York	2018
ASME B31.4	Liquid Transportation Systems Piping ASME Code for Pressure Piping The American Society of Mechanical Engineers, New York	2019
ASME B31.8	Gas Transmission and Distribution Piping Systems ASME Code for Pressure Piping The American Society of Mechanical Engineers, New York	2018
ISO 14692	Petroleum and natural gas industries- Glass-reinforced plastics (GRP) piping - DIN EN ISO 14692-3	2017
ASME CL1	NB-3600 "PIPING DESIGN" in ASME-BOILER AND PRESSURE VESSEL CODE SECTION III SUBSECTION NB CLASS 1	2019
ASME CL2	NC-3600 "PIPING DESIGN" in ASME-BOILER AND PRESSURE VESSEL CODE SECTION III SUBSECTION NC CLASS 2	2019
ASME CL3	NC-3600 "PIPING DESIGN" in ASME-BOILER AND PRESSURE VESSEL CODE SECTION III SUBSECTION ND CLASS 3	2019
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EN 13445-3	Stress Analysis of FESU structures acc. to EN 13445-3 Appendix C	2018
ASME VIII Div 2	Stress Analysis of FESU structures acc. to ASME VIII Div 2 Part 5 (Elastic Stress Analysis Method)	2019

General

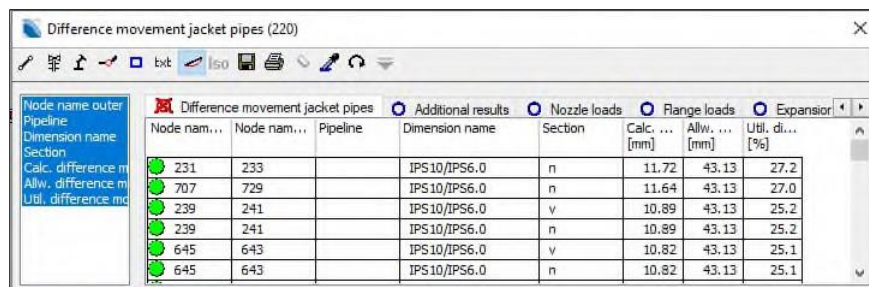
- Import of pipe classes from PROBAD is now possible.
- For the Help->Support Request function it is now possible to include additional e-mail addresses. These additional addresses automatically get a copy of the support e-mails that are send. This allows to include a distribution list for the communication with the ROHR2 Support team.

Presentation mode

- The north arrow can now be displayed.
- The display of time history results now is possible.

List function

- The difference movements between jacket pipe and inner pipe are now included in the list functions.

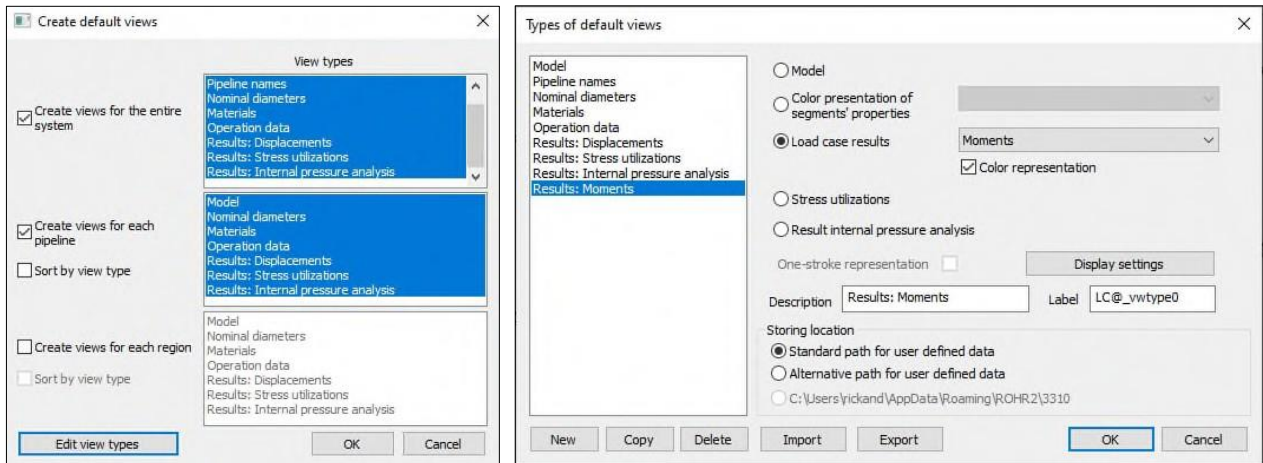


Node nam...	Node nam...	Pipeline	Dimension name	Section	Calc. ... [mm]	Allw. ... [mm]	Util. di... [%]
231	233		IPS10/IPS6.0	n	11.72	43.13	27.2
707	729		IPS10/IPS6.0	n	11.64	43.13	27.0
239	241		IPS10/IPS6.0	v	10.89	43.13	25.2
239	241		IPS10/IPS6.0	n	10.89	43.13	25.2
645	643		IPS10/IPS6.0	v	10.82	43.13	25.1
645	643		IPS10/IPS6.0	n	10.82	43.13	25.1

- A new table with an overview of all support types was added, which gives the general data for the supports.
- Multiple entries in the list of texts can now be modified at the same time.
- For the texts, the groups and attachments are also listed and can be modified.
- The fonts for the texts can be modified.
- The reducer table now includes the information about eccentric or concentric reducers.
- Flanges: The face of the flange can now be modified using the right mouse click.
- Flanges: The flange type can now be modified using the right mouse click.
- The results for jacket couplings are now listed.
- A table for viscous dampers and snubbers was added.
- For expansion bellows and reducers, the element length is now also listed.
- For sections, the listing now includes insulation thickness and inner lining.

GUI / Handling

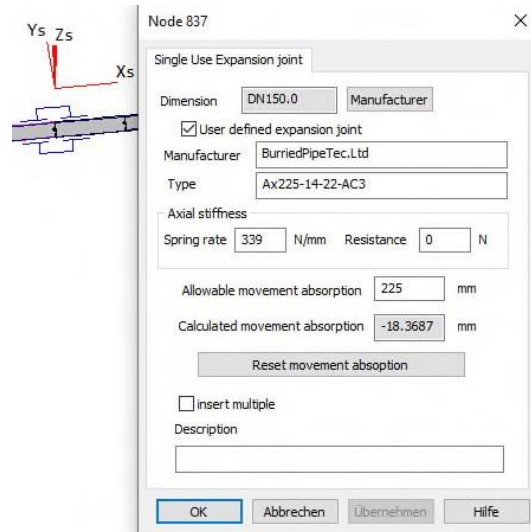
- Views: In order to get more control about the views, they can now be combined in groups and the groups can be shown in a tree structure.
- The generation of standard views was extended. Now user defined standard views can be generated. The standard views can be generated for each pipeline separately or they can be created for each region. For each of the user defined views, the elements to be displayed can be selected.



- System parts including substructures can now be copied and pasted across different models. This was limited to copy and paste inside the same model previously.
- The export function now allows to save the model including all results for the display in the ROHR2-Viewer. The model and the results can then be visualized but not modified any more.
- The order of the entries in the dimension dialog can now be modified using drag and drop.
- The “insert multiple” function was now extended to all components.
- Text tag prototypes now can be exported and imported too which makes possible an exchange of the settings between program users.
- Moving text tags and node name is now also possible while in the result mode.

Modelling

- A new component “single use Expansion Joint” for distributed heating systems was added. These expansion bellows are used for the installation of distributed heating systems to create a pretension. The piping system is installed and covered with soil, but keeping an access to the expansion joint. Then the system is pre-heated to a defined temperature and the blockage of the expansion joints is welded to introduce the correct pretension in the system. This process can now be simulated by defining a specific load case for the pre-tension phase in which the compression of the expansion joint is determined. This compression is then included in the calculation of all subsequent loading conditions.



Soil data and buried pipes

- Buoyancy forces can now be included as line loads in combination with the soil cover weight for buried pipes. These forces are now considered for the verification of vertical stability acc. to EN13491.
- Axial surfaces in pipes at reducers and ends are now considered when calculating the soil reaction forces.

Loads

- The wind loads can now automatically be calculated acc. to ASCE 7-2016.
- Seismic loads can now automatically be calculated acc. to ASCE 7-2016.
- Seismic loads acc. to UBC can now be determined for soil type SF.
- Determination of fluid hammer forces can now be performed automatically across substructures. The connections are identified for substructures inserted in the pipe.

Calculation

- The bends of type B (from EN10253) are now included in the stress calculation using the average thickness between intra-dos and extra-dos wall thickness. The requirement of EN 10253 to maintain at least the same wall thickness extra-dos as the connecting pipes, leads to an increase of the average wall thickness compared to the previous DIN 2605. This is now taken into account to avoid to overestimate the flexibility of these bend. This feature can be enabled or disabled in the project settings.
- EN13941: The limit states A2, C1 and D are now added for bedded pipes.
- Stress analysis according to ASME B31.4, ASME B31.8: As an option, the verification SLR can now also be performed for non-restrained pipes. In this case the axial internal pressure forces are taken into account to 100% instead of 60%.
- Stress analysis VGLSR: The ovalization stresses from soil reaction can now optionally be included either acc. to EN 13941, ATV or AGFW FW401.

Result display and result checking

- A new text-type “maximum results” was created. This creates a tag that is always display at the location of maximum value in the current results. This value is the same as the one previously displayed in the status line.
- For flanges the ratio of P_{eq}/P_N can now be checked automatically.

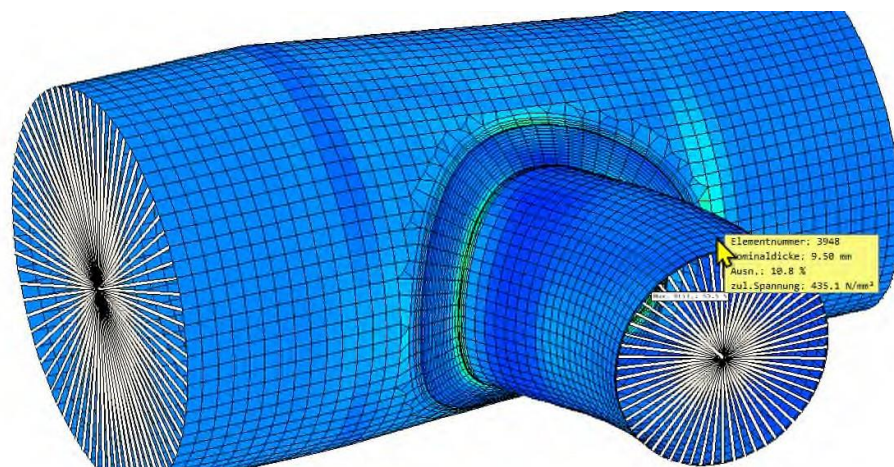
- For nozzles which are set to “no weight loads” (which means they are decoupled from the system during the spring design), the deformation break is checked against a limit. The decoupling for the spring design only works correctly if there are springs in the vicinity of the nozzle that can take the loads so that the deformation break at the nozzle remains small. If the deformation break is big, this usually means the automatic spring design cannot minimize the nozzle loads from weight effectively based on the current location of the springs so the user should check the approach.
- Stress analysis VGLSR, VGLSP: The detailed results for each element of a load case group can now be displayed at a node.
- For stress verification acc. to FW401 and EN13941 the detailed results can be displayed at nodes.

Documentation

- The logo for the drawings can now (in addition to *.bmp) format also be provided in form of *.jpg, *.png and *.gif files.

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- Deleting a super element of type bend now recreates two straight cylinders in the same way as deleting a bend component in the pipe model recreates the straight segments.
- A bend element can now be subdivided with additional points in two partial bends.
- For intersections, the shell and the intersecting elements can now be modified after creation.
- The properties window allows to display the allowable stress for the shell elements.



- The “insert multiple” function can also be used for adding intersection multiple times.
- The automatic search for intersection during creation of a substructure was extended.
- Groups of texts can now be defined.
- Texts can now be listed.
- Standard views for the equations SPMP and SPP (pressure test) are now generated.

Internal pressure design

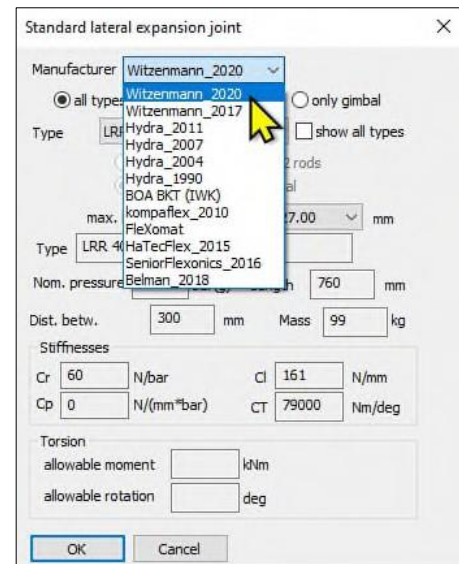
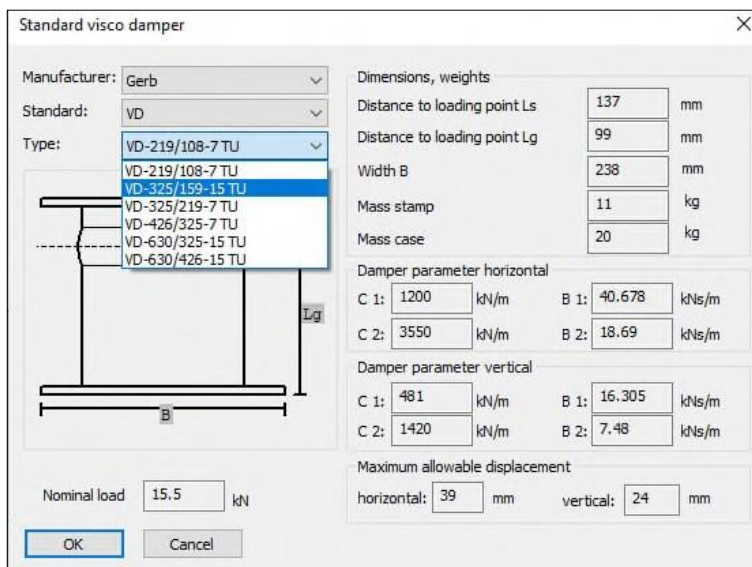
- For the verification against external pressure (buckling) of pipe dimensions, it is now possible to specify a maximum length between stiffeners. This allows to reduce the conservatism for some cases.

Interfaces

- import CII: Reducers can now be taken into account.
- Import DXF: ARC is now interpreted as bend.
- Import CAEPIPE:
 - node definitions in global coordinates can now be read
 - imposed rotations at anchor points can now be read
- Interface SDNF: The dialog for the assignment of profile types has been revised.

Databases

- Expansion joints: Witzemann-Data edition 2020 added
- GERB viscous damper of type VD were added



Support

Software-Support:

+46 21 471 31 03

support@skios.se