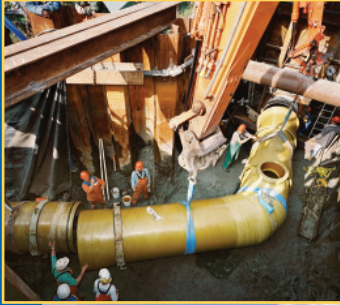


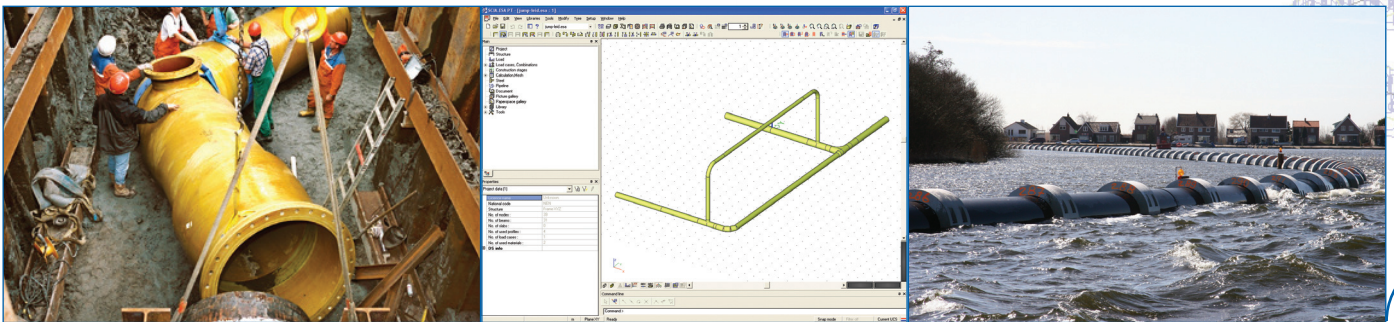
Enabling Innovation in Construction



SCIA • Pipeline is a special program for design of continuous, variable supported pipelines. Some of the calculations that are possible with SCIA • Pipeline:

- Horizontal directional drilling,
- Sinking of floating pipelines,
- Installing pipelines from a floating ship or pontoon,
- Pipelines in settlement sensitive soil,
- Dike crossings,
- Installing pipes in open trenches.

The program has been developed in close cooperation with Visser & Smit Hanab and Grontmij.

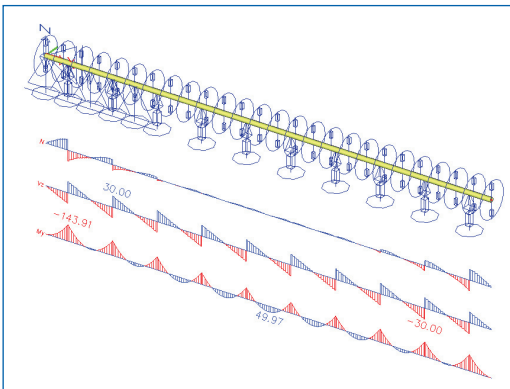


General

The program is based on the famous 2D/3D software called SCIA • ESA PT: a worldwide used program for the analysis and design of all kinds of structures. In this environment, special extensions have been developed for calculating pipelines.

A special wizard has been developed to be able to make the input fast and easy. The benefit of using the platform from SCIA • ESA PT is that many existing functions can be used that have been tested all over the world. This improves the quality of the special pipeline program and also guarantees the continuity in the future; it is not a new stand-alone program that can only be used for pipeline calculations. The program can also be used for many other structural calculations.

Within SCIA • Pipeline you can model 3D pipelines taking into account large displacements and deformations. The pipeline will have an interaction with the soil or only with water (sinking of pipelines). The whole calculation will be done in construction stages. For each stage the geometry and the soil properties can be defined and loading- and displacement history from the previous stages is taken in consideration. This implicates that during the overall calculation, pieces of the pipeline can be removed or added, soil properties can be changed and loading can be added or removed.



For each stage the force distribution and the deformation can be displayed. The check according the NEN 3650 can be done per stage (this check is optional). For other countries it is possible to implement other checks or we can save the results in XML format so that the user can link it to his own checking programs.



Summary of Highlights

- The theory of large displacements is used
- The soil properties are translated to non-linear springs with multiple branches and an elasto-plastic behavior.
- The friction between the soil and the pipe for axial displacement and rotation is taken into account. There is a dependency between these two springs.
- The calculation is done with non-linear construction stages. So each next stage starts with the deformed shape of the previous stage.
- In each stage geometry and soil can be removed or added
- The program takes into account the influence of internal pressure for the axial and the tangential calculation.
- Along the pipeline the diameter and wall thickness can vary.
- In the program you can define flanges, reducers (symmetric or a-symmetric) and valves.
- In the tangential calculation horizontal support pressure is taking into account.

