Even today many floor plans will be generated using 2D CAD systems, though the several components of a plant do exist already as 3D objects! This leads to a “media break” which prevents on one hand a better automation and on the other hand produces poor quality and generates high follow-up costs – because with 2D based planning many problems occur the first time at the construction site or during the plant assembly.

Nevertheless sales departments kept planning based on 2D up to now because the creation of 3D floor plans has been considered as too complex and even skilled 3D CAD experts were not able to do this job right away. But this is over now.

3D floor planning with SOLIDWORKS®

With the add-on Lino 3D layout for the CAD system SOLIDWORKS you can generate meaningful floor plans – which are used for planning and selling industrial plants – in the shortest possible time – using a pretty straightforward approach! Because with Lino 3D layout you’ll assemble your plant components just as easy as LEGO bricks – and even employees with little CAD knowledge will be able to create complex 3D floor plans in a rather short time.

This actually enables sales staff (which are typically not 3D CAD experts) creating 3D floor plans for complex machinery or industrial plants directly at the customer in order to visualize their solution and even enable a “walk-through” – and in case of an order – they can transmit the data lossless to their design department.

Instead of start drawing 2D sketches at the customer and getting the first floor plan back from the project department after days, now also complex 3D floor plans can be created by non-CAD experts in almost no time. This means that sales staff can show up with a feasible floor plan result during the first customer visit!

Using the elaborated Lino 3D layout Drag&Drop functionality in conjunction with the sophisticated „snap technology“ 3D floor plans may be created intuitively and changed rapidly based on configurable SOLIDWORKS components.

Because of the consequent usage of the SOLIDWORKS virtualization technology you can open and edit even very large floor plans in a short time – and if necessary you can pass it easily without losing file references.

Lino 3D layout supports the user by providing intelligent function models with a set of configuration rules and by highlighting the different linking possibilities between the particular layout components.

Lino 3D layout is fully integrated into SOLIDWORKS in the best possible way as a „Single Window Integration“ and can be installed within a few minutes.
First, the user seeks in a library the required plant component and drags it with the mouse in his project assembly. During the drag operation all possible snap positions for this component will be highlighted in form of red balls.

If the user then reaches one of the red balls with the mouse, the new component “snaps” automatically in the right position (drag & drop). The necessary mates will be created by Lino 3D layout automatically in the background.

If Lino 3D layout finds out that the new component can be configured, then the configuration tool “TactonWorks Engineer” will be started automatically. The user can now input the technical data which are required for the configuration. The technical rules and constrains which are stored in the components make sure that only meaningful input will be accepted – and that the component will only be modified towards allowed respective meaningful shapes and sizes.

Using the Lino 3D layout “Triad” the user now positions and turns groups of associated components with a so far unknown comfort until each component is located at the right place. Not only thus Lino 3D layout differs significantly from the “classical” assembly handling in SOLIDWORKS.

If required, the user can split component chains easily in order to add components in between. Additionally the orientation of a component can be changed with only a mouse click – without taking care of SOLIDWORKS mates.
The integrated library provides advanced search functionalities for finding the required plant components by either a full text search or a hierarchical search. The hit list contains not only the components with their pictures (also in high resolution), but also technical data, manuals, web links and even videos. So the user has all information at his disposal to choose the appropriate component for the specific layout – at one single location! The search does not only look for the names of the components, you can rather find components by searching for keywords in the content of the related documents. Components can be dragged & dropped directly from the hit list into the layout project.

With the tool „Lino 3D search indexer“ – which will be shipped together with Lino 3D layout – you can easily create your own component library. More than that you can even create several application specific libraries which allow you to switch from e.g. a sales library (with simplified parts) to an engineering library (with fully detailed assemblies). The tool indexes document content too, extracts pictures from SOLIDWORKS files and creates the connection between components and their documents.

Additionally Lino 3D layout provides a demo library which contains a full set of configurable example components. These can be used to try out the different functions of Lino 3D layout immediately.

When adding configurable components into a layout the TactonWorks integration ensures that the configuration dialogue will pop up. The input used for configuring the component will be stored in the assembly – guaranteeing that each component of a layout may be re-configured at any time without losing input.

Manipulation tools: Lino 3D layout provides a number of different manipulation tools which are always available in the particular context:

• Lino Triad – serves as an easy-to-use manipulation tool for component chains. You can move whole chains relatively to each other, position them absolute and rotate them. All possible restrictions in SOLIDWORKS which may prevent the movement (like fixations) will be suspended automatically.

• Splitting and linking functions – tools for the intuitive splitting of chains or linking of components to chains complete the maintaining possibilities for chains.

• Component exchange – if implemented accordingly a fully detailed engineering assembly can be visualized instead of the simplified sales component and used for review by only two mouse clicks – keeping the initial configuration input values! The same function allows you switching between mirror-inverted components or “left-right” variants.

Definition tools: Lino 3D layout delivers all the necessary tools for the administrator in order to prepare components for their usage in the application. For instance the Snap wizard makes it easy to define the mate references which are needed for the automated positioning of the components. Another tool helps defining the face(s) which may be used for their usage in the application. For instance the Snap wizard makes it easy to define the mate references which are needed for the automated positioning of the components. Additionally you can rather use target mate references which allow to exchange in an existing floor plan either all or chosen obsolete components with their up-to-date revisions – by only some mouse clicks. In order to do so the software checks in the background for each component if the revision stamp in the used component is the same as the current revision in the particular component in the library.
Customer benefits

- When using Lino 3D layout you can strongly reduce the time for creating floor plans and thereby also the time for creating a quotation – which gives you a significant competitive advantage.

- A floor plan which has been created in 3D and the resulting possibilities respective output formats ("walk-through", animated videos, 3D printouts etc.) creates a much higher impression to your end customer and appears much more professional than a "2D line grave".

- Because of the interactive layout creation in 3D the user and the customer see immediately what happens when the layout is being changed – and they can much better estimate the consequences.

- The usage of 3D based floor plan creation allows the early recognition of possible collisions and problem zones and helps therefore avoiding follow-up costs for last-minute changes on the construction site. The prevention of only one fatal error may amortize the investment in Lino 3D layout immediately.

- From the 3D layout assembly model all the needed data for calculation and ordering can be derived. In case of creating construction trades all the necessary information about bearing loads and media connections may be determined from this layout.

Application cases

Plant engineering, silo/container construction, steel building, chemical plants, material handling, rail systems, exhibition stand construction, packaging machines, air conditioning technology, feeding technology, street furniture and many more.

Gerhard Schubert GmbH uses Lino 3D layout for configuring and layouting their TLM packaging machines.