

LINEAR Solutions

for  **AUTODESK**
Revit



THE BEST SOFTWARE SOLUTION FOR BETTER BUILDINGS.

Founded in 1989 in Aachen , LINEAR became a worldwide innovator in digitizing the design of building systems by providing software solutions and services for the MEP design. The brand stands for competence in technical calculation and CAD design applications within BIM processes. Initially conceived as a pure schematic drawing tool, LINEAR today offers the largest product portfolio of design software for building services engineering from a single source: drawing, calculation, simulation and 3D design programs – seamlessly integrated, easy to use and therefore easy to learn.

Our solutions are developed together with designers, construction companies and industry partners in a trusting relationship. Especially the cooperation with our industry partners helped us to get into the product details, with many advantages for our customers: easy handling of complex systems and processes, planning reliability also for product innovations and finally complete bill of quantities with all articles for offers and tenders. The permanent development of our software enables customers to respond to the fast-paced demands of their business with appropriate tools. In addition to our solutions, we are represented in the market by the OEM software of our industry partners with more than 20,000 registered workplaces.

We have been grown into a healthy and independent software company with thousands of customers from design offices, trade and industry. Our employees are dedicated engineers and technicians, who combine deep knowledge of the MEP industry and leading CAD-platforms with the latest software development tools.

Every day, our customers produce thousands of designs and calculations while our solutions prove themselves worldwide in demanding projects. The fact that these can be safely migrated when switching to new operating systems, CAD versions or even when standards are changed has always been and still is our first priority.

LINEAR is an Autodesk “PSR Partner” and a Microsoft “Gold Certified Partner”. By these, maximum compatibility of the software is ensured. It is probably the combination of creativity and continuity, qualified sales engineers, support and training offers and of course the constructive feedback of our large user community, which in the end leads to professional software and last but not least to investment security.

What moves us is our common mission:
THE BEST SOFTWARE SOLUTION FOR BETTER BUILDINGS.



REVIT FOR MEP

In order to support the emerging requirements associated with BIM processes, Autodesk Revit became the most popular CAD platform preferred by MEP designers.

But even without the need to satisfy BIM requirements, the concept behind Revit proves to be a logical evolution of CAD-based design. The provision of several alternatives in design options and the management of several design phases such as inventory, reconstruction, expansion in one project gives the model a further benefit.

The 3-dimensional construction in storeys and work levels and the simple creation of different plans for the output reflects also a great advantage of the 3D design in Revit. This, in combination with the parametric database model, results in a system that is definitely future-oriented.

Revit pursues the concept of covering as many disciplines, working methods and display options as possible in a single software application. Everyone involved in the design process should be able to work

with the same CAD platform. Enabling cooperation on large international projects inevitably leads to a complexity that places enormous demands on those who "only" want to realize their MEP design in Revit.

This is exactly where we come in, making Revit a powerful tool for building services engineering with a multifunctional set of context-dependent tools coupled with intuitive organization options, collaboration tools and a clearly structured user interface.

SOLUTIONS FOR EVERY DISCIPLINE



Heating



Cooling



Potable Water



Waste Water



Ventilation



Gas

The right solution for every discipline

Whether CAD constructions or technical calculations are concerned, LINEAR supplies you with the appropriate software solutions for all common trades of building services engineering. These intuitive tools ensure an optimized workflow in an integrated design process.

The right tool for every task

Our solutions are geared to your workflow. We provide the right tool for every step of the design process in building services engineering. From the concept phase, through analysis of the architecture and system dimensioning to detailed design and exact calculation - you will find the right tool within LINEAR Solutions.

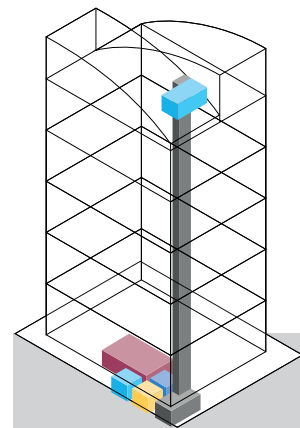
The model as „Single Source of Truth“

All relevant parameters and results can be saved directly in the model. This ensures that there is only one valid source of information, the model itself. You can optionally write the parameters directly to the individual components. In this way, changes in the model or the exchange of objects can directly affect the calculation results. Using the powerful parameter manager, you can respond individually to project specifications and provide your services according to the requirements.



WORK-FLOW STEP BY STEP

We will guide you step by step through the LINEAR workflow in Autodesk Revit, from the concept phase to printing the results.



STEP 1 CONCEPT PHASE

Input

Conceptual body of the architecture with rooms, storeys and functional areas

Output

Located space requirements for technical equipment rooms and supply pipeline corridors

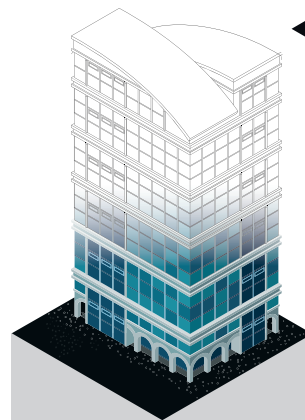
Work steps

- Dimensioning and placement of technical equipment rooms
- Dimensioning and positioning of supply pipeline corridors

The architect creates a concept body and defines rooms or storeys and functional areas. You already use this early concept model for dimensioning and placement of the technical equipment rooms. Afterwards you communicate the results back to the architect using provisions for spaces. If changes are needed, they will be carried out until the positions of the technical equipment rooms are agreed. You then dimension and place the supply pipeline corridors and transfer them back to the model. After any necessary correction loop, the basic framework is set to move forward to the design stage. The architect now knows where space is needed for the MEP design, and time-consuming corrections in later phases can be avoided.

Ideally, you already receive the building model as a Revit model and use this as the basis for the MEP model, in which you are doing the MEP design. Alternatively an IFC model can be used. If you only receive 2D plans, our tools help you to create a 3D architecture model with minimal effort. You can comfortably create building parts, storeys, levels, work levels, rooms, MEP spaces and zones and enrich them with further information such as target temperatures or internal loads. The automated view control facilitates the work and creates order in the design. The LINEAR Parameter Manager allows the determination and assignment of shared network parameters.

STEP 2 MODEL ENRICHMENT



STEP 3 BUILDING ANALYSIS

Input

Architectural model with additional information for the analysis

Output

Building detection and analysis including the information required for load calculations

Work steps

- Automatic model detection and transfer to LINEAR Building
- Communication of errors with other design participants (e.g. the architect)
- Supplementing of relevant values

After enriching the architectural model with MEP-specific information, it is ready for design and analysis. The model is transferred and analyzed in LINEAR Building. The program checks the model and points out shows errors within the creation of the architecture as well as missing values. Errors in the architectural model can be communicated to the architect via the free LINEAR collaboration tools based on BCF. Any missing data for the analysis (e.g. U-values) can be calculated or added manually. A clear display of building parts, storeys and rooms enables a quick orientation. The detected building model is the basis for all load calculations and dimensioning.

Input

Architectural model or plan

Output

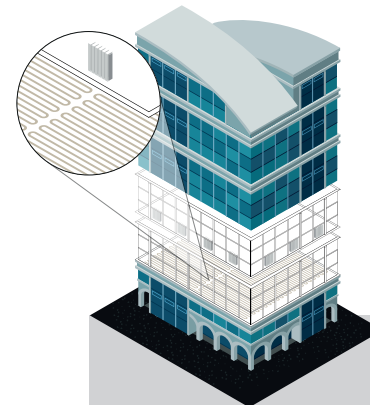
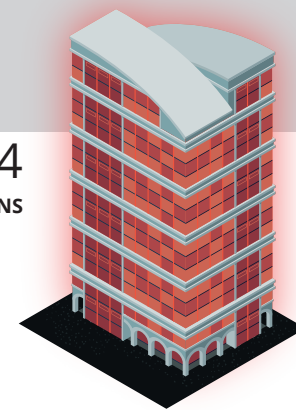
MEP optimized architectural model including storeys, zones & spaces

Work steps

- Creation (not applicable) and enrichment of the 3D building model
- Create a storey table
- Creating spaces
- Zoning
- Create first views and plans

Once the building has been completely detected and analyzed, you start the load calculations. The program determines these for the project, the storeys or individual spaces. The LINEAR heat and cooling load calculation is available for this purpose, with the intuitive interface enabling convenient entry of calculation-relevant data.

STEP 4 LOAD CALCULATIONS



STEP 5 DIMENSIONING

Input

Load calculations

Output

Calculation/optimization of the dimensioning and transfer to the model

Work steps

- Selection of components
- Dimensioning
- Transfer into model

The automatic radiator and convactor dimensioning as well as the calculation and dimensioning of panel heating or cooling systems are available for the dimensioning. Extensive manufacturer libraries enable product selection prior to the dimensioning. Selected components are transferred directly into the Revit model: Radiators and convectors are positioned below the windows and the panel heating or cooling systems according to the area plan. Adjustments can be made in the model or in the dimensioning and can be transferred bidirectional.

Input

Detected building with calculation-relevant values

Output

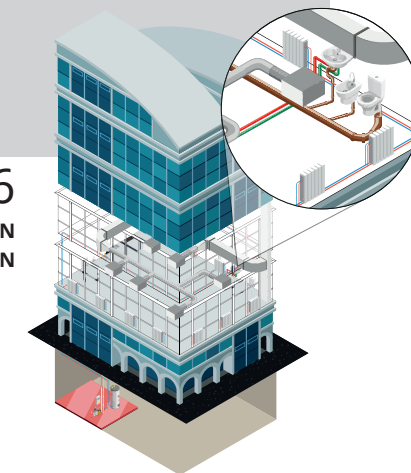
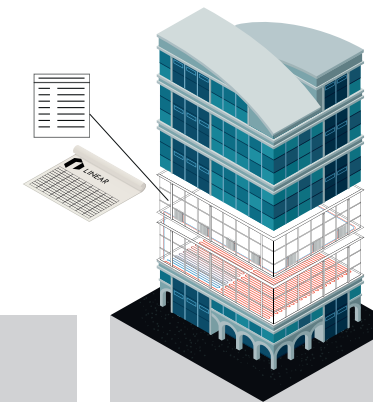
Heat load, cooling load

Work steps

- Supplementing analysis-relevant values
- Evaluation of alternatives
- Load calculations
- Output of the calculation results

In step 6, you will design the network and integrate the supplier. Consumers are connected followed by the detailed design of the network. Select neutral or manufacturer-specific components from the library and define them according to your specifications. Then start the network calculation. If necessary or available, the program points out optimization possibilities as reports which you can go through step by step. You can edit them, enrich them with information and forward them to other participants using BCF (including IFC if required). Finally, the network is being redimensioned. The LINEAR void planning with a powerful collaboration tool simplifies the coordination process with architects and structural engineers in both closed and open BIM-projects.

STEP 6 SYSTEM CREATION, CALCULATION AND COLLABORATION



STEP 7 LABELING AND PRINTING RESULTS

Input

MEP model with optimized systems

Output

Final MEP model for implementation into the overall design and output of results

Work steps

- Definition of labels and selection of the exported values
- Labeling
- Delivering of the final MEP model to the client
- Printing of results, parts lists, etc.

Input

MEP model with dimensionings

Output

MEP model with optimized systems and the approval of required slots and voids

Work steps

- Network construction incl. components and supplier
- Calculation, optimization and redimensioning of networks and systems
- Coordination with architects and structural engineers concerning voids

LINEAR Desktop

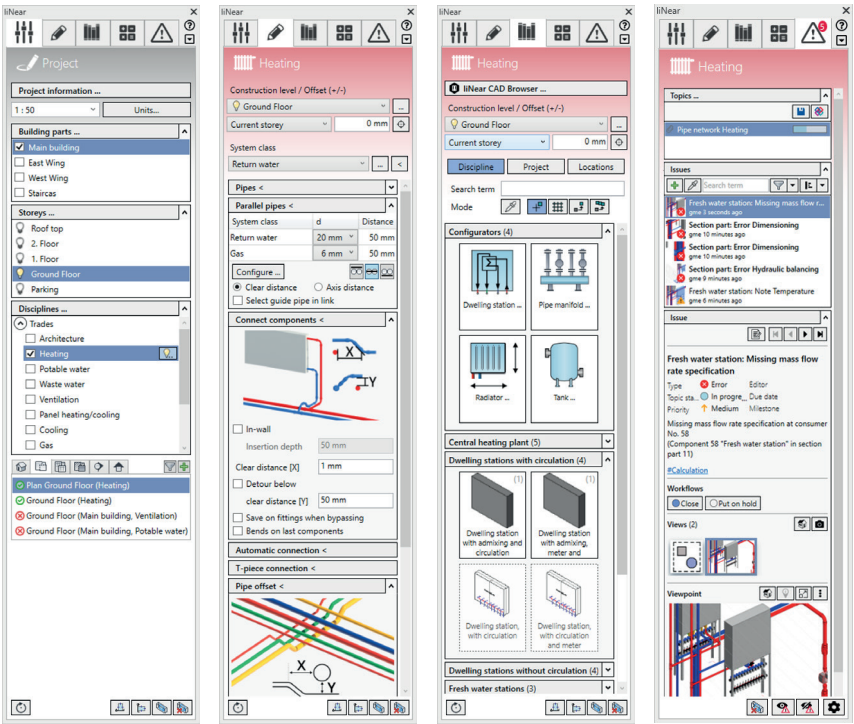
Construction tools, View control
Library management, Collaboration tools

DESIGN EFFICIENTLY

The LINEAR Desktop turns Revit into a real MEP solution. Not only the comfortable provision of our tools, but also the sorting, bundling and simplification of the Revit functions is our approach. Commands from Revit are tailored to MEP design, extended and clearly integrated into the LINEAR Control Board. The handling is intuitive and always workflow-oriented. Logical view control and creation, well-arranged libraries, one-click visibility control, discipline-specific tool sets, individual parameter manager and tools for collaboration in closed and open BIM projects are only a few of the benefits of the LINEAR Desktop.

FEATURES

- LINEAR Control Board including all relevant functions
- Automatic view control and creation
- Visibility control of storeys and component groups
- Assistant for section views and selection boxes
- Parameter manager for mapping of any project standards
- Classification manager for IFC and cost groups
- Tools for technical equipment rooms and pipeline corridors in early design phases
- Design and construction commands for all trades (connect connection, parallel pipes, etc.)
- Pipe offset function for resolving collisions
- Panel heating/cooling assistant
- Configurators for radiators, manifolds, dwelling- stations and ventilation devices
- Tools for the construction design
- Library management including manufacturer libraries with approved components
- Void planning with tools for collaboration with architects, structural engineers and other participants
- Report and task manager with collaboration tools
- Automatic labeling (configurable)



MODULES



LINEAR Analyse

Pipe network calculation, Duct network calculation,
Redimensioning, Labeling

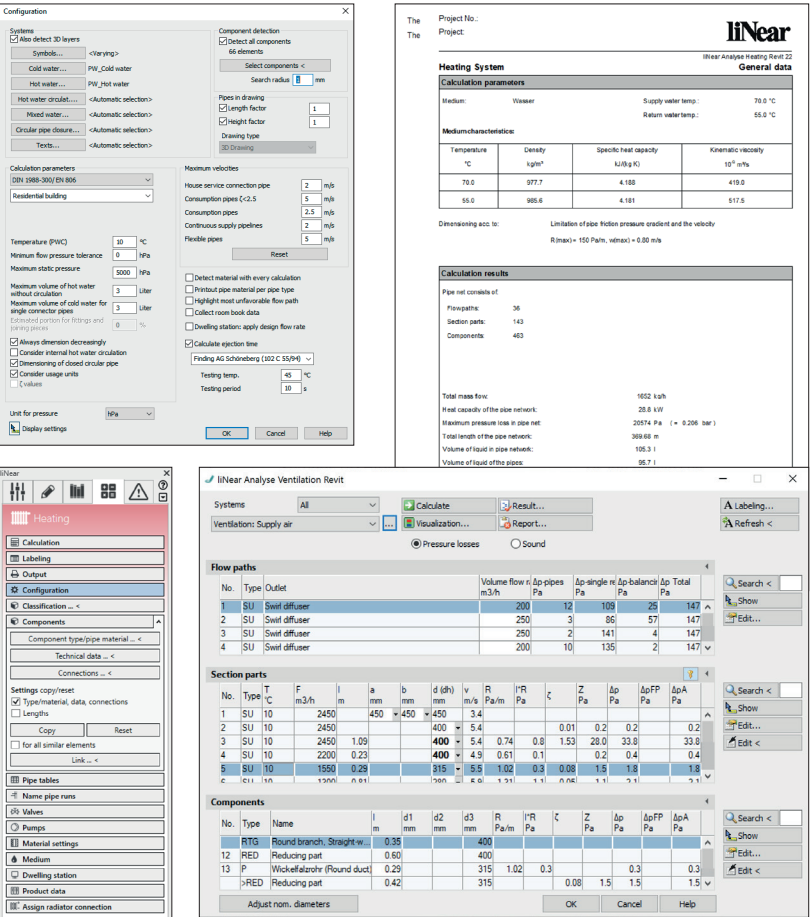
NETWORK CALCULATION DIRECTLY IN THE MODEL

Reliable and standard-compliant hydraulic and acoustic calculations of MEP systems are the basis for professional building services engineering design. With LINEAR Analyse you can calculate heating, cooling, potable water, waste water, gas and ventilation systems directly based on the model. Perfect integration with Revit eliminates error-prone interfaces and enables BIM-compliant design. Exact calculations, short design times, clear and comprehensible results as well as complete bills of quantities make the LINEAR Solutions such efficient.

FEATURES

- Calculation directly in the model incl. redimensioning
- Hydraulic and acoustic calculations with transfer of performance data from family parameters
- Calculation of multiple systems in one model
- Selection of suitable (manufacturer) components based on the calculation results
- Saving of values directly in the model with optional consideration in the IFC export
- Clear and comprehensible calculation results as well as complete bill of quantities
- Interface for valve data sets, shut-off valves, differential pressure closed-loop controllers, volume flow closed-loop controllers, regulating valves, control valves and fixed resistors
- Visualization of results using LINEAR Data Coloring (dimensions, materials, velocities, unfavorable flow path and many more)

MODULES



LINEAR Building

Building analysis, Heat and Cooling load calculation

STANDARD-COMPLIANT CERTIFICATES AND DIMENSIONINGS

Whether heat or cooling load calculation: LINEAR Building quickly delivers reliable results. The functions include manual input and automatic import from 2D drawings and 3D building models. You reduce the time for the energetic analysis of the building to an absolute minimum by using the construction material tables, the integrated calculation of U-values, the concept of global variables and your own project templates. A detailed dimensioning of system components such as radiators or panel heating and cooling systems based on actual products leads to complete parts lists for the creation of bills of quantities.

MODULES

 Building Heating

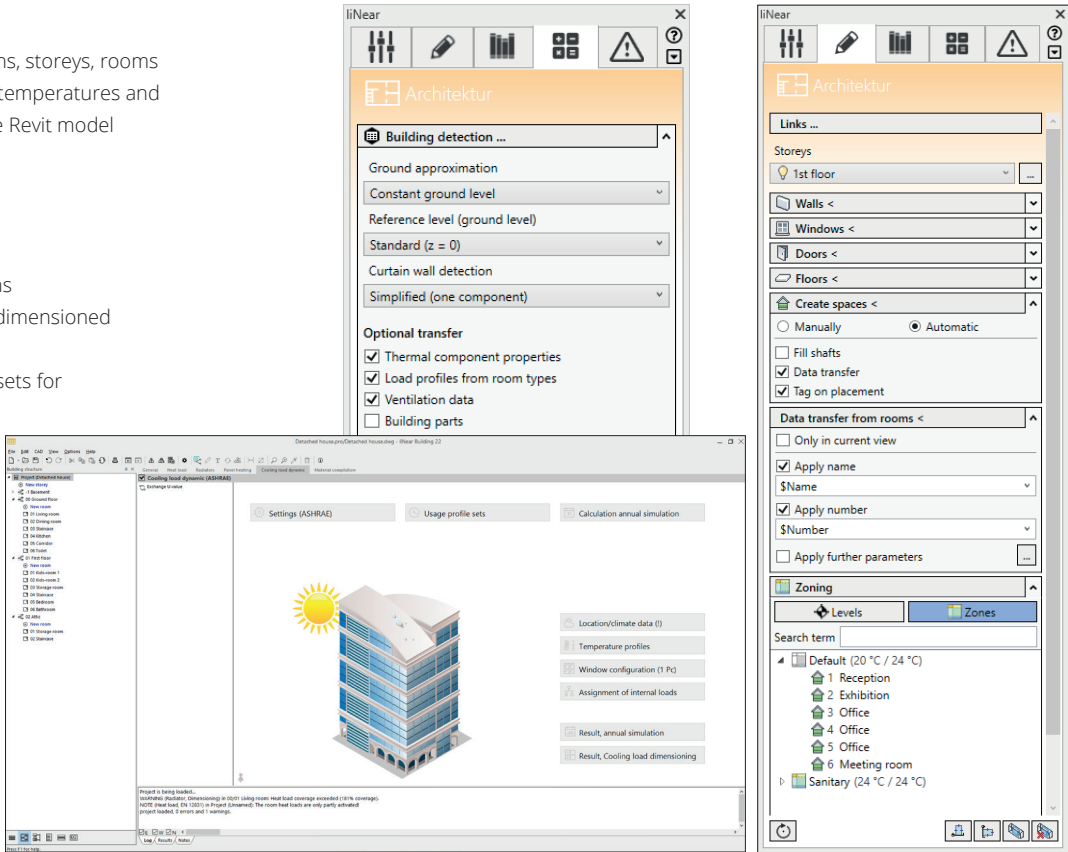
 Building Analyse

 Building Cooling Dynamic

 Building Task

FEATURES

- Automatic transfer of all building sections, storeys, rooms and room components including room temperatures and adjacent temperatures directly from the Revit model
- Quick and easy U-values calculation
- Heat load calculation
- Dynamic cooling load calculation
- Dimensioning of radiators/convectors
- Dimensioning of heating/cooling systems
- Transfer and automatic drawing of the dimensioned components into Revit including labels
- Extensive catalog of manufacturer datasets for dimensioning



WHICH MODULE FOR WHICH WORK STEP?

Work Step	Required Module(s)											
	Desktop Heating	Desktop Water	Desktop Ventilation	Building Analyse	Building Heating	Building Cooling Dynamic	Analyse Heating	Analyse Cooling	Analyse Ventilation	Analyse Potable Water	Analyse Waste Water	Analyse Gas
Determining Space Requirements in early Design Phases	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>									
Collaboration Tools for the BIM Process	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>									
MEP Model Creation and Collaboration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>									
Building Analysis												
Heat Load Calculation												
Cooling Load Calculation												
Dimensioning of Radiators, Convectors & Panel Heating												
Dimensioning of Cooling Convectors & Panel Cooling												
Heating Pipe Network and Central Heating Unit Design												
Cooling Pipe Network and Cooling System Design												
Air Duct Network and Ventilation Unit Design												
Potable Water Pipe Network and System Design												
Waste Water Pipe Network and System Design												
Gas Pipe Network and System Design												
Heating Pipe Network Calculation												
Cooling Pipe Network Calculation												
Air Duct Network Calculation												
Potable Water Pipe Network Calculation												
Waste Water Pipe Network Calculation												
Gas Pipe Network Calculation												

☐ Optionally one of these modules ☒ Modules are necessary for this step



LINEAR GmbH
Im Süsterfeld 20
52072 Aachen
Germany

Tel.: +49 241 88980-10
info@linear.eu
www.linear.eu