AUTODESK AutoCAD

AUTODESK Revit

LINEAR

ARKANCE SYSTEMS

AUTODESK Platinum Partner

## Autodesk

Autodesk, a global leader in 3D & 2D design, engineering, and entertainment software, has been at the forefront of innovation for over three decades. Established in 1982, the company has continuously driven progress in various industries, empowering professionals to imagine, design, and create a better world. With a diverse portfolio of software solutions, Autodesk caters to a wide range of sectors, including architecture, engineering, construction, manufacturing, and media and entertainment.

Over the years, Autodesk's commitment to excellence and technological advancements has garnered recognition and trust from millions of users worldwide. The company's software suite provides powerful tools and workflows that enhance collaboration, boost productivity, and enable sustainable and efficient design practices. Autodesk's comprehensive ecosystem fosters creativity and empowers professionals to tackle complex challenges, delivering innovative solutions that shape the future of design and construction.

## Autodesk Revit

Autodesk Revit, a flagship product of Autodesk, is a game-changer in the world of Building Information Modeling (BIM). Launched in 2000, Revit revolutionized the design and construction industries by offering an integrated platform that combines 3D modeling, intelligent elements, and data-rich information. This holistic approach allows architects, engineers, and construction professionals to collaborate seamlessly, ensuring a unified and coordinated design process from concept to construction.

The power of Revit lies in its ability to create virtual representations of buildings, complete with all the necessary data and attributes. This intelligent model serves as a shared knowledge resource, facilitating communication, reducing errors, and enhancing decision-making throughout the project lifecycle. Revit's versatility enables professionals to visualize and analyse design alternatives, perform accurate simulations, and streamline documentation processes.

As the go-to solution for BIM, Autodesk Revit has become an indispensable tool for design and construction projects of all scales. Its continuous development and integration with other Autodesk products make it an essential asset for modern professionals seeking efficient, sustainable, and collaborative design solutions.

## Autodesk AutoCAD

Autodesk AutoCAD, a flagship product and a pioneer in Computer-Aided Design (CAD), has played a pivotal role in transforming the way designs are created and visualized. Introduced in 1982, AutoCAD quickly became the industry standard for 2D drafting and 3D modeling. Its user-friendly interface, comprehensive tools, and versatility have made it an enduring choice for architects, engineers, and designers across the globe.

AutoCAD's precision and accuracy make it an indispensable tool for creating detailed technical drawings and plans. Its ability to handle complex geometries, annotations, and layers ensures that professionals can communicate their design intent effectively. Whether working on architectural plans, mechanical designs, electrical schematics, or civil engineering projects, AutoCAD remains a trusted ally in the creation of precise and detailed drawings.

With a legacy of continuous improvement and adaptation to technological advancements, Autodesk AutoCAD remains a foundational software in the design and engineering industries. As technology evolves, AutoCAD continues to empower professionals to translate their ideas into reality, shaping the world we live in through innovative and precise design solutions.

# Expanding Horizons: Driving Innovation and Efficiency in Building Systems Design with LINEAR GmbH's MEP Software Solutions on top of Autodesk Revit and Autodesk AutoCAD.

## LINEAR

In today's dynamic world, the construction industry demands streamlined processes and innovative solutions to meet the ever-evolving challenges of building design and engineering. Since its inception in 1989, LINEAR GmbH has been at the forefront of transforming the way building systems are planned, calculated, and simulated, through its pioneering MEP software solutions. This whitepaper explores in detail how LINEAR's comprehensive product portfolio, strategic partnerships, and customer-centric approach have reshaped the landscape of building services engineering and revolutionized the concept of Building Information Modeling (BIM).
delivering innovative solutions that shape the future of design and construction. This solution is 100% compatible with the Autodesk Revit and Autodesk AutoCAD software.

## 1. A Journey of Innovation

From its humble beginnings in Aachen, LINEAR GmbH's journey has been one of continuous innovation and growth. The company's founders envisioned a future where technology would play a pivotal role in simplifying the complexities of MEP design. Over the years, LINEAR has embraced emerging technologies and diligently refined its software offerings to cater to the unique needs of the construction industry. Today, LINEAR stands tall as a global leader, renowned for its technical expertise and commitment to excellence.

## 2. Empowering the Design Process

At the core of LINEAR's success lies its diverse and comprehensive product portfolio, designed to streamline every stage of the design process. From initial schematic drawings to complex calculations, simulations, and 3D modeling, LINEAR's software applications provide an all-encompassing suite of tools that ensure seamless integration and optimal workflow efficiency. The software's user-friendly interface empowers designers and engineers, regardless of their expertise level, to create, visualize, and refine building systems with ease.

## 3. Building on Collaborative Foundations

Collaboration has been the driving force behind LINEAR's ability to develop innovative solutions tailored to industry requirements. By actively engaging with designers, construction companies, and industry partners, LINEAR gains valuable insights into real-world challenges. This close collaboration enables the software to evolve in tandem with industry trends, addressing emerging demands such as sustainable design, energy efficiency, and compliance with evolving regulations.

## 4. The Power of Integration

LINEAR's commitment to providing a seamless experience extends beyond its own product suite. As an Autodesk "PSR Partner" and a Microsoft "Gold Certified Partner," LINEAR ensures its software seamlessly integrates with Autodesk platforms and tools. This compatibility streamlines data exchange, enhances collaboration among stakeholders, and reduces the potential for errors during the design and construction phases. A big plus from LINEAR's solutions to the Autodesk software is that it uses no interfaces when designing. While the competitor's solutions are creating issues when designing, LINEAR solutions are not triggering any errors when using it for any (complex) designs.

## 5. Harnessing the Strength of Community

LINEAR's global user community plays a pivotal role in shaping the software's future. The company actively seeks feedback and suggestions from its users, valuing their unique perspectives on software functionality and performance. This active engagement has resulted in the development of user-centric features, making LINEAR's software even more efficient and relevant to the daily challenges faced by design professionals.

## 6. Making Buildings of Tomorrow

LINEAR's impact on the construction industry extends far beyond its software capabilities. By empowering professionals with powerful design tools, the company contributes to the creation of sustainable, efficient, and aesthetically pleasing buildings of tomorrow. The software's ability to handle complex systems, offer planning reliability, and generate comprehensive bill of quantities ensures that each project is well-prepared for success from the outset.

## 7. Investing in Customer Success

LINEAR's dedication to customer success is evident through its commitment to ongoing support and training. The company's skilled support team ensures that customers receive prompt assistance whenever needed, fostering a sense of security and confidence in the software's capabilities. Additionally, comprehensive training programs empower users to unlock the software's full potential, ensuring they derive maximum value from their investment.

## Conclusion

As we conclude this exploration of LINEAR GmbH's MEP software solutions, we are reminded of the transformative impact this innovative company has had on the world of building systems design. LINEAR's journey from a schematic drawing tool to a global innovator in BIM technology stands as a testament to its unwavering dedication to driving excellence and efficiency in the construction industry. With a collaborative approach, strategic partnerships, and a passion for empowering its user community, LINEAR continues to revolutionize building services engineering, making it simpler, more accurate, and more sustainable than ever before. As we look to the future, LINEAR's commitment to providing the best software solutions for better buildings promises to inspire continued advancements in the way we design, construct, and inhabit the built environment.

# Making Autodesk Revit a Real MEP Solution: A Seamless Integration with LINEAR GmbH

In our pursuit of driving innovation and efficiency in building systems design, it is imperative to explore the seamless integration of LINEAR's MEP software solutions with Autodesk Revit. This integration unlocks the full potential of Revit as a professional MEP solution, empowering designers and engineers to overcome challenges and create efficient MEP designs. By combining the strengths of LINEAR and Autodesk, we offer you a comprehensive suite of tools and workflows, streamlining each discipline, from Heating and Cooling to Potable & Waste Water, Ventilation, and Gas systems – all from a single, reliable source.

## 1. Unleashing Powerful Workflows

LINEAR Solutions have been meticulously designed to provide suitable workflows for each specific discipline within MEP design. This ensures that every aspect of your project, no matter how complex, can be handled with precision and efficiency. Whether you are working on Heating, Cooling, Water systems, Ventilation, or Gas systems, LINEAR's tools seamlessly complement Autodesk Revit's capabilities, elevating the MEP design process to new heights.

## 2. Direct Integration in Revit

Gone are the days of dealing with error-prone interfaces and tedious data transfers. With LINEAR's direct integration in Autodesk Revit, you can now work with confidence, knowing that your MEP designs are based on accurate and reliable data. This integration streamlines the entire workflow, allowing for a clear and uninterrupted process from the initial concept to the final construction design and prefabrication.

## 3. Empowering Your Design Process

LINEAR not only offers a comprehensive solution but also provides optimal support across all design phases. From the early conceptualization stage to the creation of detailed models, including load and net calculations, LINEAR's software suite enhances the efficiency and accuracy of your MEP design. This empowers you to focus on the creative aspects of your project, confident that the technical complexities are being expertly managed.

## 4. From Concept to Fabrication

A crucial aspect of any MEP design workflow is the seamless transition from concept to fabrication. LINEAR facilitates this transition by offering tools and solutions that ensure consistency throughout the project's development. From design optimization to construction detailing, LINEAR helps you avoid duplicate work, eliminate errors, and maintain a cohesive and efficient design process.

## 5. Ensuring Economical and Detailed Results

An integral workflow that eliminates redundancies and enhances collaboration is essential for achieving economical and detailed results in MEP design. LINEAR's integration with Autodesk Revit and AutoCAD ensures a cohesive approach that maximizes productivity while minimizing time and effort. With a unified and optimized workflow, you can focus on delivering high-quality MEP designs that meet the highest standards of the industry.

## 6. Investing in the Future

As a result of this partnership between LINEAR and Autodesk, the future of MEP design is brighter than ever before. The seamless integration and combined capabilities empower professionals to tackle complex challenges with confidence. With LINEAR providing the ideal solutions and Autodesk Revit serving as the foundation for your MEP projects, you have the tools necessary to innovate, create, and construct buildings that are efficient, sustainable, and technologically advanced.

## Conclusion

The integration of LINEAR's MEP software solutions with Autodesk Revit and AutoCAD represents a significant milestone in the quest for optimal and efficient building systems design. By combining the strengths of both platforms, we have created a unified and powerful solution that empowers you to overcome challenges, streamline your workflows, and achieve remarkable results in MEP design. With LINEAR and Revit working in harmony, you can confidently embark on your journey to create better buildings and shape the future of the construction industry. Together, we envision a world where innovation and collaboration pave the way for sustainable and visionary building projects that stand the test of time.

# The power of LINEAR solutions in Autodesk Revit software put into practice

## BIM taken to the extreme: Viega World is ready!

System supplier Viega has created a Europe-wide reference project for the future of construction with the construction of a new interactive training center, the approximately 12,000-square-meter “Viega World” at its site in Attendorn-Ennest.


*Fig. 1: The new Viega seminar center “Viega World” is integrally planned in the virtual model using the BIM working methodology.*

System supplier Viega has created a Europe-wide reference project for the future of construction with the construction of a new interactive training center, the approximately 12,000-square-meter “Viega World” at its site in Attendorn-Ennest. This is because it is the first time that a building for educational purposes has been realized in such a consistently integrated way using the BIM (Building Information Modelling) working methodology. Many of the insights gained since the foundation stone was laid in May 2018 have therefore already been incorporated into the relevant standards and regulations. The German Sustainable Building Council (DGNB - Deutsche Gesellschaft für Nachhaltiges Bauen) has already awarded “Viega World” Platinum, the highest possible preliminary certification for sustainable building. LINEAR Solutions were used for the MEP design within this consistent BIM workflow.

“Viega World”, designed as a climate-neutral building, was completed at the end of 2022. This will be followed by a BIM-based phase of orderly commissioning lasting several months. During this phase, the interactive training center will be optimally adjusted to operating conditions in terms of energy, among other things, before Viega then offers training courses on 7,500 square meters of space on all aspects of the competence topics of potable water hygiene, energy efficiency, sound, and fire protection, as well as BIM and its implementation.

## “Viega World” - The heart of the Viega brand

The construction of “Viega World” became necessary because the existing seminar center with several thousand visitors per year repeatedly reached its capacity limits. The much-acclaimed new building now not only provides the urgently needed extension but also implements a highly modern didactic concept at the same time: The building itself is part of the educational content.

*Fig.2: Viega World Foyer (image: Viega)*

Quote from Ulrich Zeppenfeldt, Vice President Global Service and Consulting at Viega and jointly responsible for the project: “With the topics potable water hygiene, energy efficiency and fire protection as well as the matching technical system solutions, Viega stands for a brand philosophy in building services equipment that is supported by practical relevance and future viability. During the new construction of the training center, we are documenting this through integrated design with the BIM working method and through an energy standard that is oriented to the highest standards in a resource-saving and sustainable manner. The ‘Viega World’ is thus the heart of the Viega brand, so to speak.”

*Fig. 3: An essential element of the regenerative energy supply of the “Viega World” is the approximately 2,700-square-meter PV system. In addition, there is a local heating concept, because the interactive training center is additionally connected to a neighboring Viega production hall in terms of heat technology. (Image: Viega)*

## Platinum DGNB pre-certification

Meanwhile, the German Sustainable Building Council (DGNB) confirmed the quality of the sustainable construction method: It has already awarded “Viega World” with a platinum pre-certification. In addition to the ecological and economic quality of the project, this assessment also included socio-cultural, functional, technical and process quality, as well as site quality. Ulrich Zeppenfeldt: “This demanding canon of requirements cannot be met with conventional planning approaches organized linearly throughout all trades. Integrated design with the BIM working method enabled us to map the complete life cycle of ‘Viega World’ precisely along the digital model and optimize the building accordingly in detail.

Thanks to intelligently used heat inputs, photovoltaics on the roof and façade and on a neighbouring open area, as well as a local heating network with a neighbouring Viega production hall, “Viega World” generates more energy in the net primary energy balance than it requires during operation. Ulrich Zeppenfeldt: “For this purpose, for example, the most varied interrelationships between the facade design, i.e. the heat input to be achieved from it, and thermal comfort in the room, including the cooling requirement, were taken into account in advance via the integrated design according to BIM and incorporated into the detailed planning in an efficiency-optimizing manner.” “Viega World” is also a showcase model for the “Energy. Digital” research project sponsored by the German Federal Ministry of Economics and Climate Protection. Linked Data methods make it possible to visualize operating data live on an identical digital model in the future.

*Fig. 4: The new Viega seminar center “Viega World” is integrally planned as a virtual model using the BIM methodology and was consistently mapped on the BIM models during realization. The picture on the top right shows exemplary models of the MEP installations. (Images: Viega)*

The sanitary installation concept for the interactive training center was developed in a similar way. This is because in the building, which is visited by up to 200 people at a time, phases of non-use usually alternate with sudden, high peak loads during the seminars, without hygienically critical stagnation being allowed to occur. How potable water quality can be supported with the latest Viega system technology and the “AquaVip Solutions” potable water management system can also be seen in the new seminar center in the future.

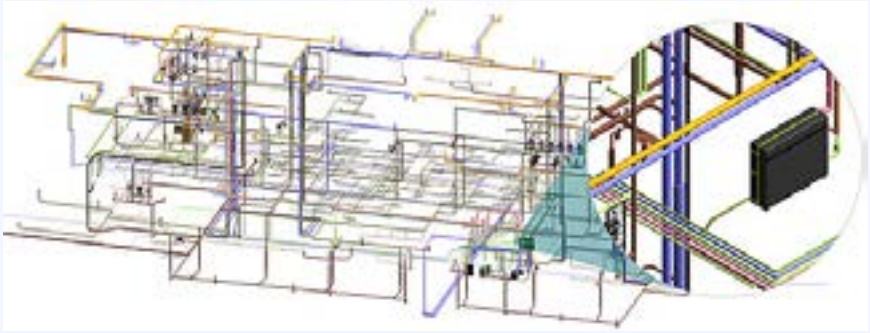

*Fig. 07: Thanks to the broad integration of Viega systems into the LINEAR Solutions, the components ultimately installed could be directly integrated into the design. Here, for example, the AquaVip Solutions system. (Image: Viega)*

Planning in Viega's field of competence "Fire Protection" was similarly complex. This is because the new three-story building is not only equipped with seminar and office rooms, but also with an underground parking. This means that, in addition to the common fire protection requirements for cable ducts within the building, the more stringent requirements of the special construction regulation issued by the federal state North Rhine-Westphalia also apply. Integrated design with the BIM working methodology was particularly helpful in this regard; more specifically: Void planning in the context of structural engineering. The solutions found for this, including Viega systems, will also be part of the seminar concept in the new building in Attendorn-Ennest in the future, just as the topics of sound insulation, ventilation/air conditioning or the operating concepts derived from building automation, in which the integrated design approach has also led to interesting, detailed solutions.

Thanks to the broad integration of Viega systems into LINEAR Solutions, the components ultimately installed could be directly integrated into the design.

## Maximum quality throughout

"The aim was to achieve the highest level of quality in design, execution, and subsequent use on all levels," says Ulrich Zeppenfeldt. And not only with regard to construction or the most economical operating phase possible, but primarily, of course, in terms of the high training quality of the Viega seminars. The technical building equipment of the interactive training center is installed in such a way that it can first be explained theoretically and then demonstrated in practice in visible open shafts and penetrations according to state-of-the-art didactics. In addition, all processes taking place in the building are subject to seamless monitoring. This means that training participants can track the development of energy demand on the building, as well as temporary peak loads in potable water demand or the temperature curve in circulation pipes.

## 100% BIM leads to new ways

The fundamental insights gained in the “Viega World” project relate in particular to the description of the object by the client (Client Information Requirements), process organization and, finally, project execution (BIM execution plan). In the latter, the collaboration of the various trades even broke new legal ground. “As a result, this led to a completely new concept- and process-based approach, but one that is likely to become standard for projects of this kind in the future,” says Prof. Dr.-Ing. habil. Christoph van Treeck, RWTH Aachen University, Chair of Energy Efficient Building. In the Viega project, he merged the process of integrated design with BIM and is now putting the concept-based approach into practice in a holistic manner.

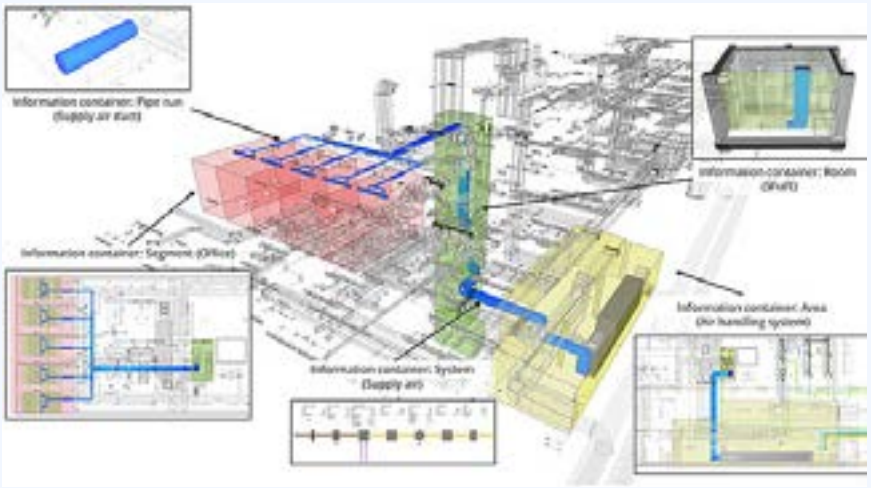

*Fig. 08: The concept-based approach and the structural models ran like a thread through the design process of Viega’s interactive training center. (Image: E3D Ingenieurgesellschaft mbH)*

## MEP as a structure provider

This included, for example, that the MEP installations provided the structure for construction. Through dedicated requirements planning, the “lifelines of the building” - such as the (piping) systems for heating, cooling, potable water, and energy - had such weight that the implemented routing concepts were sometimes considered in the design process even before the architecture and structural design.

## Building itself becomes training content

A second decisive reason for the technical building equipment as a structure provider: The “Viega World” itself becomes a training subject for integrated design and the corresponding operation. Through the open shafts and comprehensive monitoring, visitors of the interactive training center will be able to experience the consequences of this planning approach for the design of buildings in the future and the resulting benefits for investors and operators in real-time. This includes, for example, aspects such as energy management and energy efficiency, preservation of potable water quality or conservation of resources.

## Extremely detailed preliminary design

Through a combination of strategy, implementation, training, and tools, “Viega World” will, after the commissioning phase of several months, bridge the gap between the theoretical basis that has now been laid for BIM in the relevant standards and regulations and implementation across all stages of the design and realization phase: “In contrast to many other, quite exemplary BIM projects, the integrated design idea behind BIM has been thought through in unprecedented depth in ‘Viega World’ and brought into a corresponding design and action concept across all service phases,” says Prof. Dr.-Ing. habil. Christoph van Treeck.

Incidentally, this was to have extremely far-reaching consequences for the client as well as for the specialist designer or later the general contractor. The former - in this case Viega as the operator - had to describe the intended use of the seminar center and the processes behind it in unusual detail. The specialist designer, on the other hand, had to approach the dedicated specifications as well as the structuring elements developed by the project manager, for example, with a spatial approach. And the general contractor, in this case, a consortium, not only had to implement the detailed (preliminary) design with the corresponding data depth in close collaboration with the other parties involved in the process in the usual way in assembly, formwork, concrete, and structural engineering but in principle even had to digitally track every step. Only then can the underlying digital model fulfill its intended functions in the subsequent operating and ideally even dismantling phase after the end of the service life.

“And here, too,” says Prof. Dr.-Ing. habil. Christoph van Treeck, “the example of the “Viega World” enabled learning steps to be taken that will have a significant influence on the future design of construction with BIM. Practical questions such as the data transfer from the specifications or the digital room book to the subsequent trades - considering media discontinuities - are just as much a part of this as legal questions about the design of contracts when it comes to the clear assignment of responsibilities and competencies.”

# Arkance Systems

**BIM software**

Get the most out of your technology

Choose the right software, take your first steps into the world of BIM, attend training or have your software custom designed by our Holixa development service.

**Training**

Our trainings are aimed at every type of user, whether they are beginner or advanced. We offer general training courses that focus on the main functions of the software solution. The advanced trainings go deeper into these basic functions and teach you to use them more expertly and thoroughly. We also combine theory with practical exercises.

**Consultancy**

In the rapidly changing world of Information Technology, good advice is often worth its weight in gold. When in doubt about whether you are still getting the most out of your capabilities, you can count on Arkance Systems' expertise for a business analysis and advice to make adjustments.

**Support**

When you invest in software, efficient use is very important. Through our trainings, both classroom and online, our instructors will put you on the right track. Both basic courses for first-time users and advanced courses that go deeper into the subject matter are available. Our consultants and project developers can also add great value to your activities.


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