



2022

Introduction and installation instructions

MDESIGN

DIGITAL CONTENT FOR ENGINEERING

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Introduction MDESIGN 2022

MDESIGN is a family of software applications and libraries for technology, construction and development in machinery, vehicle and system construction. MDESIGN basically consists of the workplace environment MDESIGN explorer and extensive calculation libraries, such as MDESIGN mechanical for machine element designs or MDESIGN gearbox for gear analyses. There are also further subject-specific applications available. MDESIGN author is also available. This is an author system which translates factory calculations, formulae and know-how into easy-to-apply, standardized applications.

The MDESIGN user interface was developed for user-friendly applications during the calculation and design of components. It is specially designed for calculations, intelligent catalogues and access to databases and technical documents and is therefore the pioneer and gateway to technical department information and calculations. The crucial advantage is that the user interface is identical for each calculation program, each information application, each database, and catalogue selection. This guarantees a quick and simple application. Users quickly find their way around, even if they are using numerous modules at different frequencies. All knowledge objects, documents and standardized database accesses can be filed in a classification covering several levels and managed from there.

The clear structure of the screen division has been the hallmark of all MDESIGN applications for many years. It contributes significantly to the success of MDESIGN, because the different MDESIGN solutions have been used at many thousand workplaces for many years.

The product liability law, but also the EC machine directive and the ISO quality criteria allocate an ever-increasing liability risk to the company and its employees. Only those who make technical documentation of the development of the product understandable to third parties can live up to their responsibility of minimizing the risk.

To ensure this obligation to provide proof, MDESIGN is generated with automatic and individually configured calculation documents. Transparency and traceability of decision-making processes are thus guaranteed to be gapless for future modifications and examinations.

Documentation and obligation to provide proof

With MDESIGN, engineers, fitters and technicians gain efficient and recognized software solutions which can solve numerous knowledge management tasks relating to the development and selection of components, assemblies and systems quickly and safely.

This includes

- the standardization of individual calculation software,
- the company-wide distribution of technical regulations and standards,
- the simple access to databases maintained across multiple workplaces,
- the project-specific or function-related access to distributed document stores,
- the securing of in-house knowledge,
- the provision of current calculation methodology and principles,
- access to supplier industry know-how.

You can find more information about the current possibilities and provision of new MDESIGN libraries at [**www.mdesign.de/en**](http://www.mdesign.de/en)

MDESIGN product overview

MDESIGN explorer – Information system for construction and development

With MDESIGN explorer, you are creating access to online and offline information, standards, databases and contact options in research and development from the workplace. MDESIGN explorer contains an integrated formulary and a directory with tables, databases and manufacturer information.

MDESIGN libraries:

MDESIGN technology - material values and general strength analysis

MDESIGN technology extends the material database with additional materials. The general component strength verification enables a machine element independent strength verification for welded and non-welded components according to the FKM guideline.

MDESIGN mechanical - large calculation and design library for mechanical engineering.

Based on the rules of DIN, VDI, EN and ISO, the software covers almost all standard problems of mechanical design. The focus of MDESIGN mechanical is on connection, welding, spring, gearbox and drive technology.

Besides the standard modules there are also the **extended modules**. These can also be selected directly, provided that the corresponding licenses are available:

Screw connections

MDESIGN bolt - Extended bolt calculation according to VDI 2230 part 1

Safety aspects make the design of bolted joints a particularly sensitive task in design. MDESIGN has adopted the basic principles developed by the VDI in MDESIGN bolt and supplemented them with numerous practical aids. In addition, there is the possibility to verify bolted connections also according to Eurocode 3.

MDESIGN multibolt - calculation of multi-bolted connections

MDESIGN multibolt extends the application area of MDESIGN bolt (bolt connection, VDI 2230 - calculation of single bolt connections) to multi-bolt connections. As a basis MDESIGN multibolt uses the set of rules of **VDI 2230 part 2** and the resulting necessity to determine boundary conditions and loads with the FE method. MDESIGN automates this process for selected bolt patterns in such a way that the individual use of a complex FE system is not necessary.

MDESIGN product overview

Shaft, Axles

MDESIGN shaft - Extended shaft calculation with strength verification according to DIN 743 and FKM guideline

MDESIGN shaft provides the designer with an extension module that offers a whole range of additional functionalities according to DIN 743 and a practical verification according to the FKM guideline for professional use. The geometry input can be done with CAD data through **MDESIGN connect**.

Rolling bearing

MDESIGN bearing - design and calculation of rolling bearings

While the rolling bearing calculation, standard is still aimed at normal users, MDESIGN bearing additionally supports the consideration of bearing combinations, nominal, and modified reference life according to DIN 26281 or ISO/TS 16281 and result interpretation and documentation extension via result graphics.

Gearings

MDESIGN gear - Advanced calculation of gears

While the available standard gear calculations are aimed at normal users, MDESIGN gear supports advanced calculations for plastic gears according to VDI, for bevel gears according to AGMA and DNV, the flank fracture and micropitting load capacity, and ring gears with elastic rim influence.

Gears

MDESIGN gearbox – design and examination of complete gears

Using a few preset basic parameters, the program can calculate gear solutions optimized according to mass, dimensions, or installation space.

MDESIGN LVR – design and calculation of load distribution in multistage spur gear units

Analytic calculation methods are used to guarantee rapid computing time and allow for serial calculations. All ambient deformation influences are included.

MDESIGN LVR^{planet} – stress analysis of epicyclic gear units

This program is a completely new development for calculating the load distribution in spur or helical gear stages, taking all relevant deformations into account.

MDESIGN product overview

Welded connections

MDESIGN weld - recalculation of welds

MDESIGN weld supports advanced calculations of welds and welded joint cross-sections according to DVS, Eurocode 3 and the FKM guideline.

MDESIGN nature - Physics, Dynamics, Geometry

MDESIGN nature provides the possibility to use simple formulas from mathematics, physics and especially dynamics.

MDESIGN manufacturing - Production engineering

MDESIGN manufacturing provides calculations that cover manufacturing technology like machining, deep drawing and various manufacturing processes.

MDESIGN reference - Information

MDESIGN reference makes information easily accessible; the MDESIGN Compendium.

MDESIGN components - online components catalog

MDESIGN components can be used to quickly find machine elements, components, or manufacturers.

MDESIGN process - Calculation and design library for apparatus and piping engineering

Based on the rules of DIN, "AD-Merkblätter", EN and ISO, the software covers many standard problems in hydraulics and pipeline construction. MDESIGN also enables the calculation of vessel parts.

MDESIGN espresso – provides a calculation of pressure vessels (cylindrical shells, semi-spherical bottoms with torispherical clip, ring and reinforced openings, flat bottoms, flanges), under external and internal pressure. These calculations are based on the two standards: DIN (AD-Merkblatt) and EN (EN-13445).

MDESIGN product overview

MDESIGN control - Databases

With MDESIGN control the extended databases can be accessed, new bolt dimensions can be implemented as well as bolt, shaft or spring material characteristics.

MDESIGN PDF/A – automatic creation of ISO compliant document formats.

MDESIGN supports the fast and automatic provision of calculation results for all modules in ISO-compliant PDF/A format, thus ensuring long-term archiving in accordance with the prescribed quality criteria.

MDESIGN author system

MDESIGN author - the authoring system for product catalogs and in-house technical calculations

MDESIGN author enables companies to create executable programs and catalogs as quickly as possible from formula works, associated explanations, graphics and data tables. The author system makes it possible to provide special knowledge in the form of professional standard programs to a large user group.

System requirements

A Windows-compatible PC with a screen resolution of min. 1920x1080 pixels is required. Full MDESIGN functionality in Windows on a virtual machine requires that the virtual machine corresponds 1:1 to the Windows system.

Hard drive capacity:

Server: max. 4 GB

Client: max. 100 MB

Workplace operating systems: Windows 10

Server operating systems: Windows Server 2019, 2016

64-bit versions of operating system

Memory: at least 8 GB

Installing MDESIGN 2022 next to an existing 32-bit Microsoft Office installation can damage your Microsoft Office installation. Migrate Microsoft Office to a 64-bit version before installing MDESIGN 2022 or choose a different computer to deploy MDESIGN 2022.

Operating environments such as Citrix, virtual machines, etc. may have limited functionality depending on Windows compatibility. Systems such as UNIX can be used as a "share" (e.g. Samba) for the application server. The system administrator must ensure that the corresponding directories are released, used as share (e.g. Samba) and that the MDESIGN files can be addressed by the clients.

System requirements

Firewall settings:

Release of the applications Imgrd.exe and TEDATA64.exe via the Windows Firewall.

With the hardware firewall, the ports for incoming and outgoing traffic must be enabled.

Vendor port is 28064.

The following URL must be enabled for working with MDESIGN 2022 in the firewall on the customer side:

<https://sxdms.sharepoint.com>

For the MDESIGN updates

<https://www.mdesign.info>

For manufacturer information and content pages

<https://net.mdesign.online>

For calculation information and content

<https://contact.mdesign.online>

Hotline inquiries online

<https://tedata.vemas.cloud>

Customer forum

<https://www.mdesign.de>

Content

<https://www.tedata.com>

Module actuality

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The folders, files and registration entries which are created or copied by the MDESIGN installation are described in detail in the handbook. The handbook can be accessed quickly via the main menu under "Help" via the menu option "Operating instructions".

General

MDESIGN consists of the following components:

- 1) MDESIGN explorer - Application interface with general functions for information, databases, formulary and for access to the MDESIGN calculation libraries
- 2) MDESIGN libraries:
 - MDESIGN technology
 - MDESIGN nature
 - MDESIGN manufacturing
 - MDESIGN reference
 - MDESIGN process
 - MDESIGN control
 - MDESIGN mechanical - Calculation libraries for machine elements:
 - MDESIGN bolt - Calculation library for bolt calculation according to VDI 2230 or Eurocode 3
 - MDESIGN shaft - Calculation library for shaft calculation according to DIN 743

Other libraries are available, for example MDESIGN technology, MDESIGN multibolt, MDESIGN bearing, MDESIGN lvr, MDESIGN lvr^{planet}, MDESIGN gear, MDESIGN gearbox, MDESIGN weld, MDESIGN espresso.

A library is a structured collection of modules, databases and other necessary resources.

- 3) MDESIGN author - The author system for creating your own calculation modules and catalogues

Installation instructions MDESIGN 2022

MDESIGN explorer

MDESIGN explorer is required for the use of all MDESIGN libraries and MDESIGN author. MDESIGN explorer is installed on an application server in a network. On a client, only the registration entries and settings which may be necessary, as well as system files are installed.

MDESIGN libraries

The libraries can be installed on a server or locally together with MDESIGN explorer. They must then be registered for each client (administrator rights are required for registration). Registration takes place automatically during the installation or also directly via MDESIGN explorer (for newly added or newly acquired libraries).

MDESIGN author

To use MDESIGN author, you must have installed MDESIGN explorer locally or as a server-client. The licenses for MDESIGN author must be in the same folder as all other MDESIGN licenses.

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Installation types

An MDESIGN version is defined with a date, for example 2022. There is also a build no. which is visible in the first setup dialogue or in the "About" dialogue. The updates are controlled via the build no.

Generally, the following types of installation exist:

1) **New installation:**

a) **Workstation installation (single workplace):** MDESIGN explorer, the MDESIGN libraries and the licensing tool FLEXlm are installed locally on a Windows workplace.

b) **Network installation:**

Server-client installation: MDESIGN explorer, the MDESIGN libraries and the licensing tool FLEXlm are installed on a Windows server. The clients are then installed or set up.

Server-client installation with a separate license server: MDESIGN explorer and the MDESIGN libraries are installed on an application server (Windows, UNIX etc.). The server can be a "non-Windows" server if necessary. In this case, the administrator must ensure that the MDESIGN files are accessible and the required Windows approvals are issued. FLEXlm is installed on another Windows server or a server triad. Afterwards, the clients are installed or set up. In this case, the license files must be present in the folder "FLEXlm\MDESIGN\license files 64" on the license server. They are read here by FLEXlm.

Workstation installation (single workplace) with a separate license server: Workstation installation (single workplace) with a separate license server: MDESIGN explorer and the MDESIGN libraries are installed locally on a Windows workplace. FLEXlm is installed on a Windows server. The license files are added to the folder "FLEXlm\MDESIGN\license files 64" on the license server.

2) **Changes/updates:**

see page 18

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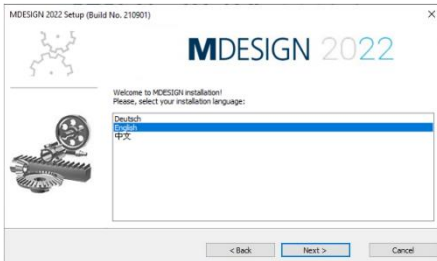
Installation process

The installation routine considers all types of installation and guides you through the installation process.

All types of installation may only be carried out by the administrator with adequate administrator rights.

The following steps must be carried out during an installation.

- 1) Log in as administrator.
- 2) Start the file "setup.exe" with the right mouse button as administrator whereupon the installation assistant appears. Follow the assistant's instructions. Define the installation language and click on "Next".

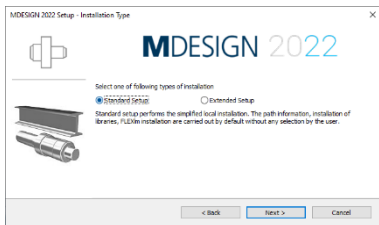


Click "Next" again after accepting the licensing agreement.



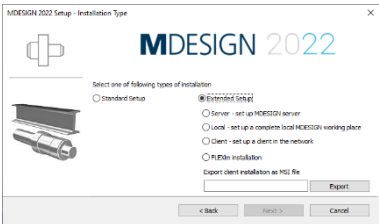
Installation instructions MDESIGN 2022

3) In the next stage, you are asked to select the type of installation.



If you want to perform a simplified local standalone installation with standard installation paths and standard FLEXlm installation, select "Standard setup". Points 4) – 7) are omitted.

This option is not permitted for a network installation.

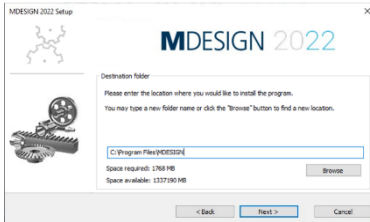


In the "Extended Setup" mode, you can choose different options for standalone or network installation.

If you want to perform a standalone installation, select "Local" off. A server installation and one (possibly several) client installations are always required for the network installation. If you have several clients in the network and want to install them remotely using an MSI file, please export the MSI file to a folder of your choice.

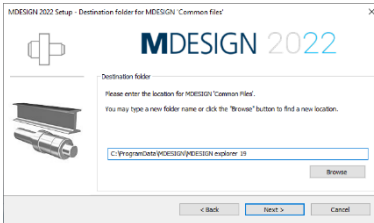
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4) For a server installation or local installation, you can select the installation folder.



It is only possible to select the installation folder if MDESIGN is being installed on the computer for the first time. The MDESIGN folder is created in the directory selected by you. All MDESIGN products or other versions then must be installed in this folder. If any MDESIGN product is already present, the folder dialogue is not displayed.

A distinction is made between 32- and 64-bit versions. By default, these are installed separately in the respective Windows program directories. A joint installation of 32- and 64-bit versions in one directory is also permitted.



The "Common files" folder can only be selected if MDESIGN is installed on the computer for the first time.

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- 5) A client installation can also be carried out with the aid of the file "MDESIGN_2022_client_de.msi" in the installation file. Distributing and starting the MSI file is carried out via the system administrator with the aid of the tools available in the company.

To start the client installation in silent mode (recommended), use the following command (in one line):

MDESIGN_2022_client_de.msi MD_SERVER_NAME="MDESIGN-Servername" MD_LICSERVER_PORT="28064" /qn

In the event of a separate FLEXIm server, this server must also be assigned:

MDESIGN_2022_client_de.msi /qn MD_SERVER_NAME="MDESIGN-Servername" MD_LICSERVER_NAME="Licenceservername" MD_LICSERVER_PORT="28064"

No additional "/" or folder names permitted.

The option "/qn" is required for a silent installation (in the background).

MD_LICSERVER_PORT - Port number for installing FLEXIm and licenses. Here, the port used (normally 28064) must be entered.

The software can be uninstalled using the standard routine „msiexec“, for example:

msiexec/x <location for msi file>

The following three packages must be installed on the client system: Visual C++ Redistributable 2013 x64, Visual C++ Redistributable 2015-2019 x64, Microsoft Access Database Engine 2016 Redistributable

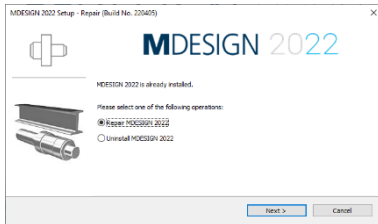
Note:

The MSI command line may only be used for the installation and not for repairing the client.

- 6) FLEXIm can also be installed separately. The option "Only FLEXIm installation" is offered if there is no FLEXIm installation yet present on this computer.
Select "Only FLEXIm installation" if you would like to install FLEXIm on a separate license server.
During the installation, the program "HostID assistant" is called up to apply for a valid license from the manufacturer.

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- 7) At the end of the first server installation or the first local installation, you are given the option of installing the licensing tool FLEXlm, if this is not already present. However, you should observe that the FLEXlm installation is only required for your server or single workplace and not for a client. Exactly one version of FLEXlm for MDESIGN must be available on your local computer or on a license server.
- 8) If MDESIGN 2022 is already available on the computer, the following options are offered:
- a) The build being installed and the build already installed are the same.



- Repair MDESIGN 2022: All files and registration entries are installed once again.
 - Completely uninstall MDESIGN 2022: MDESIGN is completely uninstalled.
- b) The build being installed is more up to date than the build already installed.
- Update MDESIGN 2022: All files and registration entries are brought up to date.
 - Uninstall MDESIGN 2022: MDESIGN is completely uninstalled.

All options are only carried out on the computer where the installation routine was begun. It is also checked whether the currently installed version is up to date. If this is not the case, an update installation is offered. This only applies for a server installation or a local installation.

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License request

The following steps must only be carried out if the Host ID file is not created directly after the initial installation. The MDESIGN core program is MDESIGN explorer. To be able to work with MDESIGN, this program must first be started.

Proceed as follows:

- 1) In Windows, click on the "Start" button and then on "Programs".
- 2) Open the folder **MDESIGN 2022**.
- 3) Then, click on the program symbol **MDESIGN 2022** with the right mouse button and execute **MDESIGN** as an administrator.



Alternatively, you can also call up the program via a link on your desktop.

The initial start takes place with the aid of the license supplied. This license allows you to start the program, the interface and the modules, but does not allow you to use the calculation functions. You must apply for a valid license to be able to use MDESIGN to its full extent.

You can apply for a valid license using the program "HostID assistant" in MDESIGN explorer. Start MDESIGN explorer on the server or on the corresponding workplace for a local installation and select the menu option "HostID assistant" in the main menu under "Help". The HostID assistant is then started. Then, follow the further instructions.

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Authorisation instructions

This chapter contains brief instructions of how MDESIGN is authorized with the FLEXlm tool. You can find more detailed user information in the FLEXlm instructions.

A floating license model is used to authorize MDESIGN in the network. This means that only a certain number of accesses to the installed MDESIGN libraries are permitted at the same time.

The following steps are necessary for the FLEXlm authorization of the MDESIGN package:

- a) Install FLEXlm.
- b) Create HostID file(s) and send to the manufacturer.
- c) After you have received the license files, copy these into the directory "...\\MDESIGN\\license files 64". Then restart the system or the service „MDESIGN License Manager 64“ (system control/administration/services).

After this, MDESIGN will be able to run, corresponding to the license obtained.

FLEXlm installation

FLEXlm, version 11.18.1.0, copyright Flexera Software, Inc. is used for the MDESIGN authorization.

FLEXlm is either installed on the server or on your computer, in the event of a local installation (workplace installation).

In client-server environments, do not install FLEXlm on the clients.

Note:

If a firewall is active on a server or client, the following points must be observed:

- Allowing lmgrd.exe (via port 28064 or via application) and TEDATA.exe (dynamic ports) applications inside the firewall for inbound and outbound traffic.

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Creation of the HostID file(s)

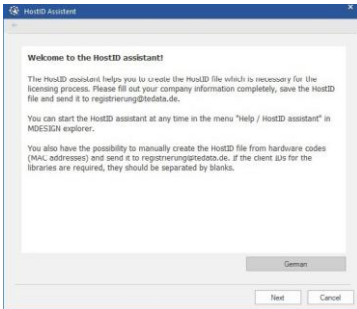
MDESIGN can be started without license files, but it will not be able to run to its full extent. To receive the acquired license, you must send the manufacturer the hardware information to which the licenses are linked. For a local installation, this is your workstation ID. For a network installation, the information is sent from your server and/or the respective clients.

The host ID file is created using the HostID assistant. You can find the assistant in the MDESIGN explorer main menu under "Help / HostID assistant".

If you are using a separate license server, the HostID must be created from this server. To do this, start the HostID assistant as a separate application on this server. You will find the HostID assistant in the "FLEXIm\MDESIGN" directory after the FLEXIm installation.

The following steps are carried out with the aid of the assistant.

1) It is explained how the HostID file is created. You can also select and set the language (German/English) here.



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2) Enter the company information

Company information

Company My Company
Address Main street 23
Phone 0234-1234567
Email info@mycompany.com
Customer number 12345

Please fill the form completely.
If you want to enter your hardware code manually please use the button 'Hardware code' below.

Hardware code Next Cancel

The fields "Company", "Email" and "Customer number" are mandatory.

If you would like to enter the hardware code manually, please click on the "Hardware code" button. The following dialogue window then appears:

3) Enter the hardware code manually

Select libraries

Libraries

Libraries	Hardware code
<input checked="" type="checkbox"/> Server Hostid	
<input checked="" type="checkbox"/> MDESIGN technology 2022	
<input checked="" type="checkbox"/> MDESIGN mechanics 2022	
<input checked="" type="checkbox"/> MDESIGN math 2022	
<input checked="" type="checkbox"/> MDESIGN multibody 2022	
<input checked="" type="checkbox"/> MDESIGN shaft 2022	
<input checked="" type="checkbox"/> MDESIGN bearing 2022	
<input checked="" type="checkbox"/> MDESIGN gear 2022	
<input checked="" type="checkbox"/> MDESIGN gearbox 2022	
<input checked="" type="checkbox"/> MDESIGN hp 2022	
<input checked="" type="checkbox"/> MDESIGN hp planet 2022	
<input checked="" type="checkbox"/> MDESIGN wheel 2022	
<input checked="" type="checkbox"/> MDESIGN espresso 2022	

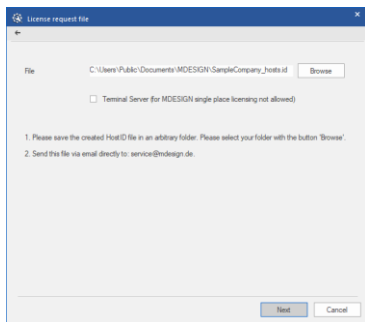
Select all
Reset all

Next Cancel

Enter the existing hardware code or the hardware codes in the corresponding gap(s). Each component can have its own code. If you do not have the hardware code, this is issued by the computer.

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4) Save the license request file (HostID file)



Note:

If you have acquired an MDESIGN network solution or the MDESIGN licenses are not active at the single workspace after restarting, please restart the service "MDESIGN License Manager 64" (system controls/administration/services).

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