Version dated 03.2026
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ARNOLD®
BlueFastening Systems



Digital Engineering

Simulation, analysis and configuration of components, screw fastenings and joints.

- Design
- Simulation
- Calculation
- Standards

Digital Engineering
Die Tools

Fast Designer Metals
Configuring thread-rolling screw fastenings in metals

Fast Designer Metric
Configuring metric screw fastenings

Fast Creator
Generating 3D CAD data for fasteners

Core hole tool
Configuring core holes for thread-rolling screws

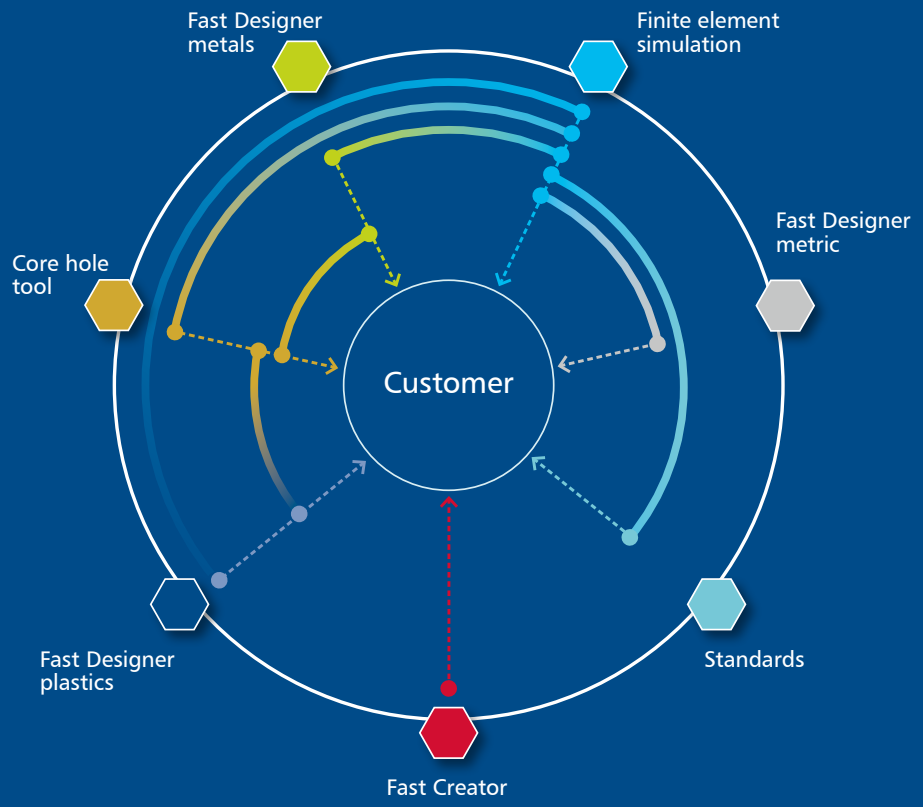
Finite element simulation
Simulating mechanical behaviour in fasteners and components
Simulating forming and joining processes

Standards
Calculations and assessments for fasteners and components in compliance with standards

Fast Designer Plastics
Configuring thread-rolling screw fastenings in plastics

ARNOLD® BlueFastening Systems

Interfaces and information flow

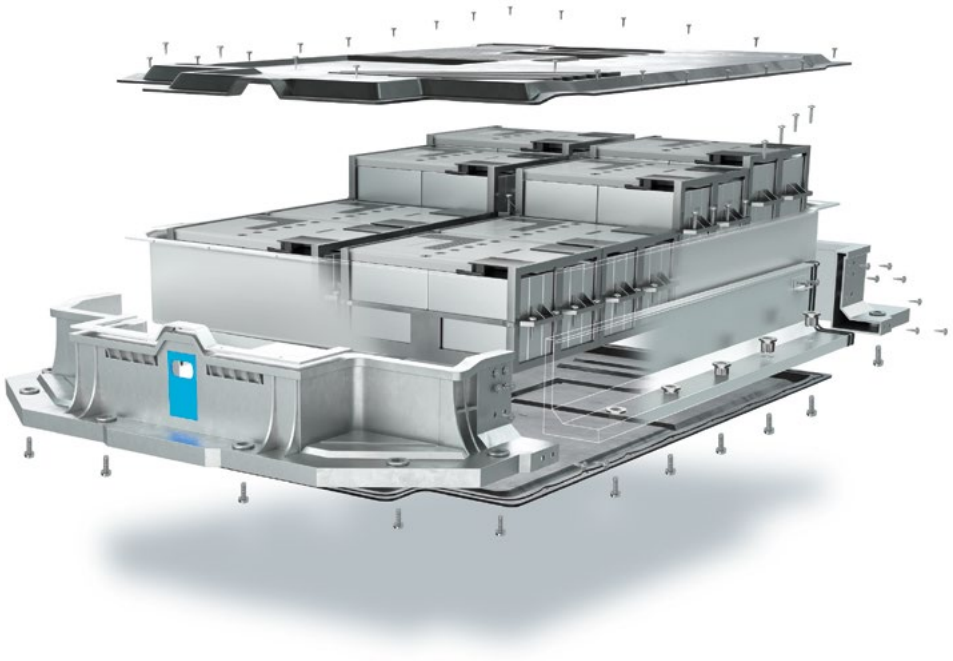


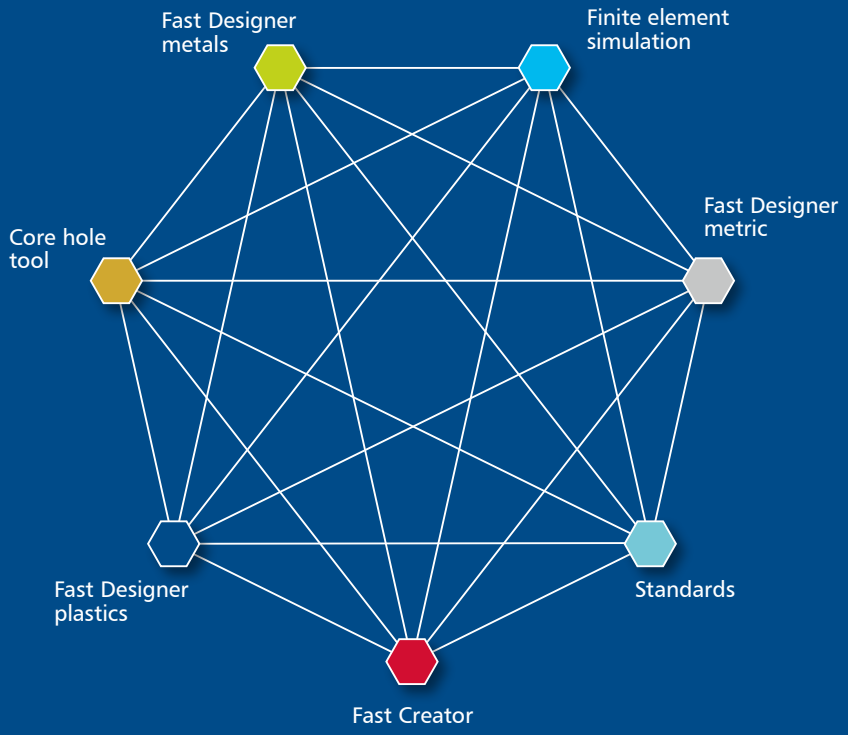
Results

Interaction between the Engineering Tools

Used as independent standalone or in combination

The **customer's task specification** defines the choice of appropriate tools or, where appropriate, several tools in combination.





Fast Creator

Generating 3D CAD data for fasteners



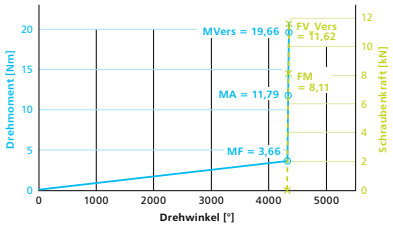
Advantages

- numerous product information documents available to download
- technical drawings and CAD data immediately available
- free of charge to My ARNOLD users

The **Fast Creator** product configurator provides options for huge numbers of different configuration variants.
Choose from the existing range of ARNOLD standard and factory standards, depending on your requirements. You can then download the technical drawings and CAD data. And we also offer further help with developing parts from drawings.

Fast Designer Metals

Assembly and strength behaviour in screw fastenings made directly into metal



Advantages

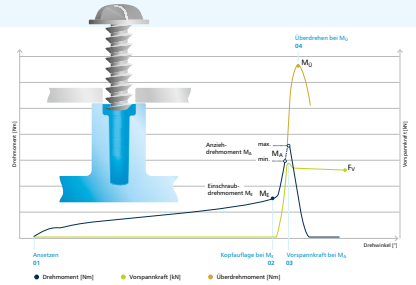
- assembly and operating reliability predictions
- interaction with the core hole tool
- based on VDI2230
- based on a comprehensive foundation of tests

Fast Designer Metals can be used to calculate various assembly and operating variables for thread-forming TAPTITE 2000SPA® screws, such as tapping torque, assembly clamp load and failure behaviour.
The base materials to receive the screws can be aluminium wrought alloys and aluminium pressure castings.

Description | Example

Fast Designer Plastics

Assembly and strength behaviour in screw fastenings made directly into plastics



Advantages

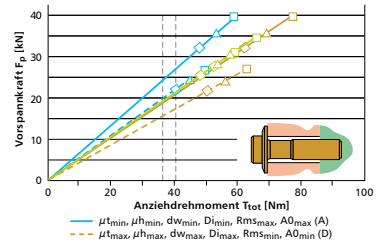
- wide range of plastic materials
- illustration of optimum tube design
- forecasting assembly parameters
- torque / clamp load progression
- clamp load forecast

Fast Designer Plastics produces valuable statements about screw fastenings made into plastics.
The calculation contains the preliminary design and tube structure, along with various assembly and operating variables. The potential for optimising weight and cost can therefore be determined. For the forecast, there is a large database of different plastic materials to choose from.

Description | Example

Fast Designer Metric

Assembly and strength behaviour in metric screw fastenings



Advantages

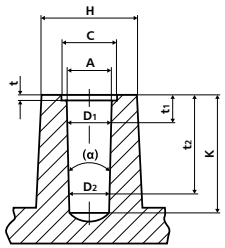
- wide range of nut and screw types
- you can enter a wide range of operating data
- recommendation for assembly parameters
- tolerances taken into account

Fast Designer Metric provides an option to calculate metric screw fastenings under thermal and mechanical loads. The calculation is based on VDI2230 and also makes use of the traditional strength concepts. Tightening recommendations can be made for every use case and for every assembly process, even for plastically stressed assembly processes.

Description | Example

Core hole tool

Configuring core holes in plastic or metal base components for thread-rolling screws



Advantages

- recommendations for metals and plastics
- comprehensive choice of screw types
- detailed engineering design specifications
- tolerances taken into account

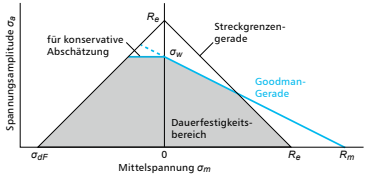
The **core hole tool** can calculate the core hole geometry of screws intended for insertion directly into metals and plastics, and recommend the optimum solution in line with the relevant tolerances.

Description

Example

Standards

Applying standards, calculation rules and standards to component design for strength verification



Advantages

- support with developing the component
- digital validation of functional capability
- recognised and reliable procedure
- universally deployable

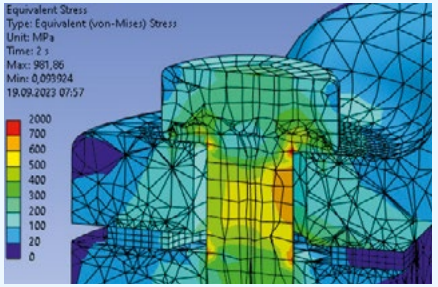
The results of our analytical, empirical, and digital calculation tools can be used in component design and analytical strength validations in recognised and proven procedures such as the VDI 2230 and the FKM guideline*.

* analytical strength assessments for mechanical components

Description

Finite element simulations

Structural mechanics: Calculates stresses and deformations in fasteners, components and assemblies under mechanical and thermal loads. Optimises component geometry for weight and stress (including for 3D printing). Examines complex screw fastenings Forms the basis of static and cyclical strength assessments.



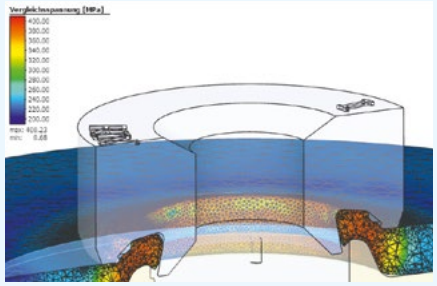
Advantages

- comprehensive range of simulation options
- detailed analysis and evaluation of mechanical behaviour
- weight and stress optimisation
- linked with standards and analytical calculation methods

Description + examples

Interaction with FEM

Forming simulation: Calculations using various calculation modules such as cold forming and mechanical joining are used to illustrate and analyse joining processes, compare variables, and create an understanding of the process. The differing results make it possible to interpret the material flow as well as loads and deformation on the tool and on the workpiece.



Advantages

- Early support for our customers during the development stage of
  - · component design and structure
  - · in selecting the correct fastener by checking component safety
- New products are more efficient
- Increases tool life
- Early fault detection and prevention
- Reduces number of trials

Description + examples



The ARNOLD GROUP

www.arnold-fastening.com

Wherever customers need us.

ARNOLD – this name is internationally renowned for efficient and sustainable fastening systems at the highest level.

With a foundation of many years of expertise in the production of intelligent fastening systems and very complex extruded parts, the ARNOLD GROUP has developed over a number of years into a comprehensive supplier and development partner for complex fastening systems. With our positioning of "BlueFastening Systems", this development process will continue under a united and harmonised structure. Engineering, services, fasteners and functional parts, together with feeding and processing systems, all from a single source – efficient, sustainable and international.

ARNOLD UMFORMTECHNIK GmbH & Co. KG
Carl-Arnold-Straße 25
74670 Forchtenberg-Ernsbach
Germany
T +49 7947 821-0
F +49 7947 821-111

ARNOLD UMFORMTECHNIK GmbH & Co. KG
Im Weitblick 1
74670 Forchtenberg-Rauhbusch
Germany
T +49 7947 821-0
F +49 7947 821-111

ARNOLD UMFORMTECHNIK GmbH & Co. KG
Max-Planck-Straße 19
74677 Dörzbach
Germany
T +49 7947 821-0
F +49 7947 821-111

ARNOLD UMFORMTECHNIK GmbH & Co. KG
Logistics center
Dörzbach plant
Germany
T +49 7947 821-0
F +49 7947 821-111

ARNOLD FASTENING SYSTEMS Inc.
1873 Rochester Industrial Ct.
Rochester Hills, MI 48309-3336
USA
T +1 248 997-2000
F +1 248 475-9470

ARNOLD FASTENERS (SHENYANG) Co., Ltd.
No. 119-2 Jianshe Road
110122 Shenyang
China
T +86 24887 90633
F +86 24887 90999

ARNOLD TECHNIQUE FRANCE SAS
267 Route Nationale 7
38150 Salaise sur Sanne
France
T +33 (0)427 698177
F +33 (0)427 698178











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