



Materials Portal – Quick Reference Guide



1. Search

Find the material by its material name, material number, material standard, vendor designation or trade name

Example: 42CrMo4

- Result list with all the material standards containing this quenched and tempered steel
- The column **Name** contains the material name, the material name and the issue of the standard

MATERIALS PORTAL

Find materials 42CrMo4

→ Compare (0) selected Show selected items

Standard status: Valid standards Only default values set

<input type="checkbox"/>	Name	Material Group	Data Last Up...	Material cards
<input type="checkbox"/>	42CrMo4 1.7225 DIN EN ISO 683-2 : 2018-09 ✓	Steel Quenched and tempered steels (EN)	25 → 13 → 12 2023-11-24	Select Solver
<input type="checkbox"/>	42CrMo4 1.7225 DIN EN 10297-1 : 2003-06 ✓	Steel Seamless circular steel tubes for mechanical and general engineering purposes (EN)	25 → 11 → 12 2000-08-30	Select Solver
<input type="checkbox"/>	42CrMo4 1.7225 DIN EN 10277 : 2018-09 ✓	Steel Bright steel products (EN)	25 → 11 → 12 2025-01-07	Select Solver
<input type="checkbox"/>	42CrMo4 1.7225 DIN EN 10263-4 : 2018-02 ✓	Steel Steel rod, bars and wire for cold heading and cold extrusion (EN)	25 → 10 → 11 2018-02-06	Select Solver
<input type="checkbox"/>	42CrMo4 1.7225 DIN EN 10132 : 2022-03 ✓	Steel Cold rolled narrow quenched and tempered steel strip for heat treatment (EN)	17 → 10 → 12 2022-03-24	Select Solver



2. Material Data Sheet

Get the material data sheet by clicking on a search result

Example: 42CrMo4

- Standard information is displayed in the center tab **Material Standard Values** of the three tabs
- Jump directly to tables of particular interest by using the outlined **navigation** buttons

42CrMo4 | 1.7225 Material Datasheet

[Home](#) / [Metals](#) / [Ferrous](#) / [Steel](#) / 42CrMo4 | 1.7225

Material Test Series Values **Material Standard Values** Material Models for Simulation

Material Description Chemical Composition Mechanical Properties Physical Properties Toughness Data (Impact) More ▾

Material Description

Material Number	Material Number (single)	Standard	Range of Application	Standard Status	Country	Predecessor
1.7225 (DIN EN ISO 683-2 : 2018-09)	1.7225	DIN EN ISO 683-2 : 2018-09	Supersedes DIN EN 10083-3 : 2007-01	Valid	Germany	42CrMo4

1) Remark: Steel 42CrMo4 is applicable for high loaded parts (also large forged parts) with high wear resistance and very favorable core properties in vehicle manufacturing, engine and machine engineering (e.g. crankshafts, pinions, balancer shafts). The steel shows high resistivity to static and dynamic loading.

Chemical Composition

C [%]	Cr [%]	Cu [%]	Mn [%]	Mo [%]	P [%]	S [%]	Si [%]
0.38 - 0.45	0.9 - 1.2	≤ 0.4	0.6 - 0.9	0.15 - 0.3	≤ 0.025	≤ 0.035	0.1 - 0.4

1) Source: EN ISO 683-2 : 2018-06

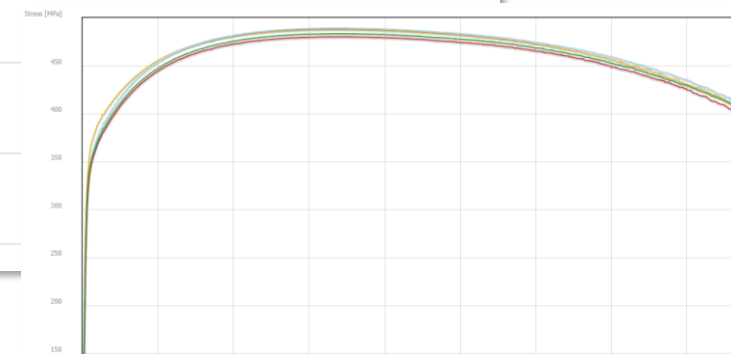
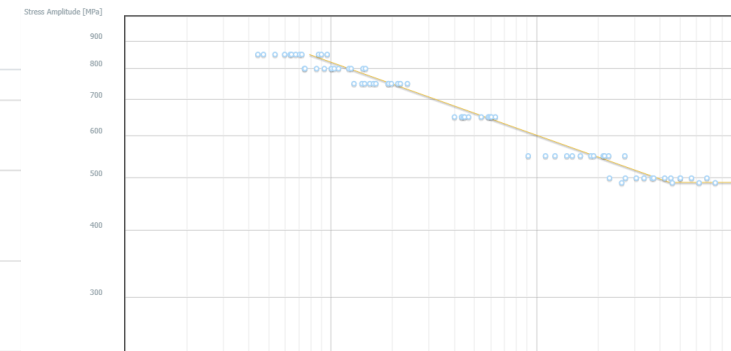
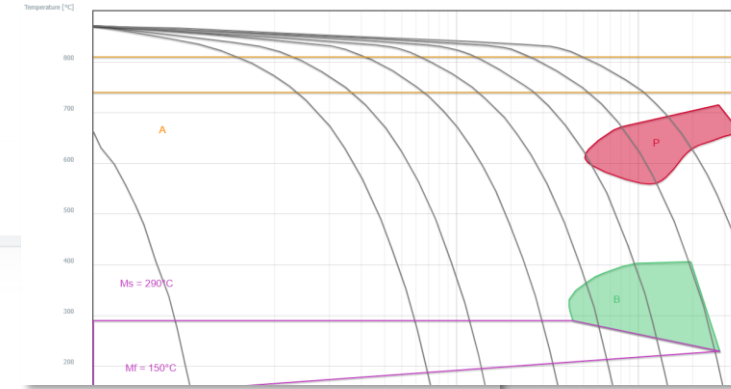


3. Material Test Series Values

Get belonging material test data from different sources *

Example: 42CrMo4

- Information is displayed in the left hand tab **Material Test Series Values** of the three tabs
- Flow curves (upsetting test) | TU Dresden
- Flow curves/ σ - ϵ curves (tensile) | TU Dresden
- Fatigue behavior - HCF (S/N) | FKM DABEF
- Fatigue behavior - LCF (e/N) | Boller-Seeger
- TTT curves | TU Freiberg
- Corrosion | Dechema, Sandvik a.o.



* available for selected materials



4. Material Models for Simulation

Get belonging material models for CAE *

Example: 42CrMo4

- Information is displayed in the right hand tab **Material Models for Simulation** of the three tabs
- Calculation model dependent data display (Strain life, Linear-elastic, Alternating stress, ...)
- Export functionality for Abaqus and Ansys solver

The screenshot displays the '42CrMo4 | 1.7225 Material Datasheet' page. It features three main tabs: 'Material Test Series Values', 'Material Standard Values', and 'Material Models for Simulation'. The 'Material Models for Simulation' tab is active, showing a 'Download materialcard' button and a preview of the material's XML export. The XML includes material details, simulation parameters, and a disclaimer.

Material Test Series Values

Temperature [°C]	Static hardening coefficient [MPa]	Static hardening exponent	Cyclic fatigue strength coefficient [MPa]	Cyclic fatigue strength exponent	Ductility coefficient [Pa]	Ductility exponent
23			1543.32	-0.08600	1447000.00	-0.710

Linear-elastic

Temperature [°C]	Young's modulus [GPa]	Bulk modulus [GPa]	Shear modulus [GPa]
-100	217.00000		
0	213.00000		
20	210.00000		
100	205.00000		

XML Export Preview:

```
<?xml version="1.0" encoding="UTF-8"?>
<EngineeringData versiondate="16.10.2013 16:34:00" version="15.0.0.504"><N
<Material><BulkDetails><Name>42CrMo4 (1.7225; DIN EN ISO 683-2 : 2018-09)<
<PropertyData property="pr0"><Data format="string">-</Data><Qualifier name=
<ParameterValue format="float" parameter="pa0"><Data>2.000E10</Data>
<ParameterValue format="float" parameter="pa3"><Data>0.28</Data><Q
<ParameterValue format="float" parameter="pa1"><Data>2.100E11</Data>
<ParameterV
<ParameterV
</PropertyData>
</BulkDetails></Mat
<Metadata>
<ParameterC
<ParameterC
<ParameterC
<ParameterC
<ParameterC
<ParameterC
</PropertyDe
</Metadata>
</MatML_Doc></Mater
** Isotropic elastic-plastic material cards
** Material: WIAM42CrMo417225DINENISO683-22018-09
** Source: WIAM (source)
** Export date: 2025-05-22
** Disclaimer: Materialcards are based on WIAM data.
** WIAM does not assure the quality of these data. B
** transversal and random orientation is performed a
** Selected output data:
** + Stress-strain measure: technical
** Exported material cards:
** + WIAM42CrMo417225DINENISO683-22018-09
-----
** Isotropic elastic-plastic material cards
** Material: WIAM42CrMo417225DINENISO683-22018-09
** Source: WIAM (source)
** Export date: 2025-05-22
** Unit system: N, mm, s, to, °C
** Material card description:
** + Stress-strain measure: technical
** MATERIAL, NAME=WIAM42CrMo417225DINENISO683-22018-09
*DENSITY
7.8300E-12
*ELASTIC
20000.,210.00,20.0
**
```

* available for selected materials | available from team license



5. Filtering

Use available filter on the left hand side menu

Example: 42CrMo4

- Filter by **Standard status**, **Material group**, **Available data** and **Semi-finished product**
- The counter shows the current number of hits
- Checking the box filters the search results

The screenshot displays the Materials Portal interface. On the left, a navigation menu includes a home icon, a search icon, and a filter icon. The main content area is divided into two sections. The top section, titled 'Plastics > Thermoplastics > TPO', lists several material categories with checkboxes and hit counts: PPS (0), PPSU (0), PS (0), PSU (0), TPU (0), and Thermosets (0). The bottom section, titled 'Available data (1/16)', lists various data types with checkboxes and hit counts: Product Information (10), Flow curves (upsetting) (9), Flow curves (tensile) (7), Fracture toughness (7), TTT curves (7), FKM Guideline fatigue data (5), Hardenability (Jominy test) (3), Crack propagation (0), Creep data (0), Magnetic data (0), and Relaxation data (0). The 'Hardenability (Jominy test)' option is checked. On the right, a search bar contains the text 'Find materials 1.7225'. Below it, there are buttons for 'Compare (0) selected' and 'Show selected items'. Two filter boxes are visible: 'Standard status: Valid standards' and 'Data: Hardenability (Jomin... x)'. The search results list three entries for '42CrMo4 | 1.7225':



- 42CrMo4 | 1.7225
DIN EN 10263-4 : 2018-02 ✓
1.7225 (DIN EN 10263-4 : 2018-02)
- 42CrMo4 | 1.7225
DIN EN 10297-1 : 2003-06 ✓
1.7225 (DIN EN 10297-1 : 2003-06)
- 42CrMo4 | 1.7225
DIN EN ISO 683-2 : 2018-09 ✓
1.7225 (DIN EN ISO 683-2 : 2018-09)



6. Advanced Search

Configure your own search result table

Example: 42CrMo4

- Configure and enhance the search result table by important data and show specified data ranges
- Start the configuration by using the property dialog button  below the Start button in the upper right hand corner
- Selection of the desired search properties and specification of the desired numerical value
- Use table header tools for value adjustment, sorting and property removing 

The screenshot shows the Materials Portal interface. At the top, there is a search bar with '1.7225' entered. Below the search bar, there are filter buttons for 'Material Group: Metals > Ferrous > S...', 'Young's Modulus [GPa]: > 210', and 'C [%]: < 0.5'. The main table displays search results for 42CrMo4 with columns for Name, Material Group, Data Last Up..., Young's Modulus [GPa], C [%], and Material cards. The Property Settings dialog is open on the right, showing 'Chemical Composition' with C [%] set to 0.5 and 'Physical Properties' with Young's Modulus [GPa] set to 210.

Name	Material Group	Data Last Up...	Young's Modulus [GPa]	C [%]	Material cards
42CrMo4 1.7225 DIN EN 10277 : 2018-09 ✓ 1.7225 (DIN EN 10277 : 2018-09)	Steel Bright steel products (EN)	25 → 11 → 12 2025-01-07	164.0 - 217.0	0.38 - 0.45	Select Solver
42CrMo4 1.7225 DIN EN 10263-4 : 2018-02 ✓ 1.7225 (DIN EN 10263-4 : 2018-02)	Steel Steel rod, bars and wire for cold heading and ...	25 → 10 → 11 2018-02-06	164.0 - 217.0	0.38 - 0.45	Select Solver
42CrMo4 1.7225 DIN EN 10132 : 2022-03 ✓ 1.7225 (DIN EN 10132 : 2022-03)	Steel Cold rolled narrow quenched and tempered st...	17 → 10 → 12 2022-03-24	164.0 - 217.0	0.38 - 0.45	Select Solver
42CrMo4 1.7225 DIN EN 10305-1 : 2016-08 ✓ 1.7225 (DIN EN 10305-1 : 2016-08)	Steel Steel tubes for precision applications, seamles...	25 → 8 → 11 2016-10-10	164.0 - 217.0	0.38 - 0.45	Select Solver
42CrMo4 1.7225 SEW 550 : 2024-12 ✓ 1.7225.00,1.7225 (SEW 550 : 2024-12)	Steel Open die steel forgings (DIN)	17 → 10 → 10 2025-01-27	164.0 - 217.0	0.38 - 0.45	Select Solver
42CrMo4 1.7225	Steel	17 → 12 → 12	164.0 - 217.0	0.38 - 0.45	Select Solver



7. Material Comparison

Generate a comparison table for the selected materials

Example: 42CrMo4

- Tabular material comparison of important data for the chosen materials
- Deselection or adding of further materials possible

The screenshot shows the 'MATERIALS PORTAL' interface. At the top, there is a search bar with '1.7225' entered. Below it, a 'Compare (3) selected' button is active. A list of materials is shown on the left, with three items selected (checked):

- 42CrMo4 | 1.7225** (DIN EN 10277 : 2018-09)
- 42CrMo4 | 1.7225** (DIN EN 10263-4 : 2018-02)
- 42CrMo4 | 1.7225** (SEW 550 : 2024-12)

The main comparison table is titled 'Compare View' and shows the following data:

Toggle parameter dependent values	42CrMo4	42CrMo4	42CrMo4
Material Description			
Material Number	1.7225 (DIN EN 10277 : 2018-09)	1.7225 (DIN EN 10263-4 : 2018-02)	1.7225 (SEW 550 : 2024-12)
Material Number (single)	1.7225	1.7225	1.7225
Range of Application	Supersedes DIN EN 10277-5 : 2008-06	Supersedes DIN EN 10263-4 : 2002-02	Supersedes SEW 550 : 1976-08
Remark	Steel 42CrMo4 is applicable for high loaded parts with high wear resistance and very favorable core properties in vehicle manufacturing, engine and machine engineering (e.g. crankshafts, pinions, balancer shafts). The steel shows high resistivity to static and dynamic loading.	Round rod, round bars and wire intended for cold heading, cold extrusion, subsequent quenching and tempering or induction hardening or flame hardening.	Quenched and tempered steel for larger forgings.
Standard	DIN EN 10277 : 2018-09	DIN EN 10263-4 : 2018-02	SEW 550 : 2024-12
Physical Properties			
Coefficient thermal expansion (CTE) [10⁻⁶°K⁻¹]	10,5 - 14,4	10,5 - 14,4	10,5 - 14,4
Density [g/cm³]	7,83 - 7,85	7,83	7,83
Differential Coefficient of Thermal Expansion [10⁻⁶°K⁻¹]	9,2 - 16,1	9,2 - 16,1	9,2 - 16,1
Mean Coefficient of Thermal Expansion	10,5 - 14,4	10,5 - 14,4	10,5 - 14,4