

The values printed in the materials properties summary appear to be incorrect

Among the summary pages of the calculation report there is the summary of the characteristics of the materials. Let's see together why these characteristics may differ in the calculation of the individual components.

Online version: <https://nextgen.sant-ambrogio.it/KB881862>

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We are often asked why the values shown on the summary page of the characteristics of the materials are incorrect.

Material properties summary

8.8 (PMA REQUIRED) (EN ISO 898-1) - Bolting (t ≤ 39.00 mm) @ 215.00 °C

Temp.	Allowable (1)	Yield strength (2)	Tensile strength	Elasticity	Thermal expansion
Room	333.33 MPa	640.00 MPa	800.00 MPa	200 021.00 MPa	0.000011500 1/°C
Design	333.33 MPa	531.00 MPa	n/a	189 482.67 MPa	0.000012833 1/°C
Test	609.52 MPa				

X1NiCrMoCu25-20-7 (EN 10028-7) - Plate (t ≤ 75.00 mm) - No.: 1.4529 @ 215.00 °C

Temp.	Allowable (1)	Yield strength (2)	Tensile strength	Elasticity	Thermal expansion
Room	226.67 MPa	300.00 MPa	650.00 MPa	195 000.00 MPa	0.000015800 1/°C
Design	171.33 MPa	187.00 MPa	514.00 MPa	180 800.00 MPa	0.000016160 1/°C
Test	325.00 MPa				

X2CrNi18-9 (AT) (EN 10217-7) - Welded tube (t ≤ 50.00 mm) - No.: 1.4307 @ 215.00 °C

Temp.	Allowable (1)	Yield strength (2)	Tensile strength	Elasticity	Thermal expansion
Room	156.67 MPa	180.00 MPa	470.00 MPa	200 000.00 MPa	0.000016000 1/°C
Design	96.00 MPa	115.00 MPa	n/a	184 950.00 MPa	0.000016575 1/°C
Test	235.00 MPa				

X2CrNi18-9 (EN 10028-7) - Plate (8.001 ≤ t ≤ 13.5) - No.: 1.4307 @ 215.00 °C

Temp.	Allowable (1)	Yield strength (2)	Tensile strength	Elasticity	Thermal expansion
Room	173.33 MPa	200.00 MPa	520.00 MPa	200 000.00 MPa	0.000016000 1/°C
Design	119.00 MPa	115.00 MPa	357.00 MPa	184 950.00 MPa	0.000016575 1/°C
Test	260.00 MPa				

X5CrNiMo17-12-2 (EN 10028-7) - Plate (13.501 ≤ t ≤ 75) - No.: 1.4401 @ 215.00 °C

Temp.	Allowable (1)	Yield strength (2)	Tensile strength	Elasticity	Thermal expansion
Room	173.33 MPa	220.00 MPa	520.00 MPa	200 000.00 MPa	0.000016000 1/°C
Design	129.50 MPa	144.00 MPa	388.50 MPa	184 950.00 MPa	0.000016575 1/°C
Test	260.00 MPa				

Notes

(1) Allowable stress calculation may vary upon component type, conditions and other factors. Refer to each component's calculation page for its allowable stress value.

(2) Yield strength shown refers to 0.2% plastic strain

On the same page, there is a note that clearly indicates the fact that the characteristics reported for the calculation may vary based on the type, conditions and other factors and to therefore refer to the calculation of the single component for the allowable value used in that calculation.

The discrepancy is due to the fact that the summarized values concern only the material, taken outside the context of application. The same material, if used to calculate different components, can have different allowables.

In the summary, the general rules for calculating the allowables are applied.

When calculating the individual components, the specific rules for the type of component are applied (for

example, in EN 13445 flanges define a different method of calculating the allowable under certain circumstances).

You must always check the calculation report of a component to verify the values used in the calculation of that component.