Material Data Sheet

Technischer Verkauf

Low alloyed copper alloy

Material designation:	EN-Material-No.	DIN-Material-
	CW111C [CuNi2Si]	No. **2.0855**

Scope

This data sheet applies to flat and long products made of precipitation hardening copper alloy CW111C.

Application

The material CW111C exhibits strength even at elevated temperatures. In addition to high wear resistance, the material is characterized by high electrical conductivity when fully hardened. In a natural atmosphere CW111C exhibits good corrosion resistance. This material is mainly used in electrical engineering and mechanical engineering as a contact material, as well as in instrument manufacturing.

Chemical composition in %

Cu	Fe	Mn	Ni	Pb	Si
Rem.[a)]	≤0,2	≤0,1	1,6-2,5	≤0,02	0,4-0,8

Other elements: total: max. 0,2 %

[a)] elements not listed in the table are included under "Other elements".

Mechanical properties at room temperature (rod, bar) acc. EN 12163

Temper	Dimensions		Tensile strength R_m	Proof strength $R_{p0,2}$	Elongation			Hardness
	diameter	hexagonal			$A_{100\ mm}$	$A_{11,3}$	A	Brinell
	[mm]	[mm]	[N/mm²]	[N/mm²	[%]	[%]	[%]	HBW
M	All	All	as manufactured, without defined mechanical properties					
R550	>20-80	>20-80	≥550	≥430	-	-	≥15	-
H150	>20-80	>20-80	-	-	-	-	-	150-190
R600	>20-50	≥20-50	≥600	≥520	-	-	≥10	-
H165	>20-50	≥20-50	-	-	-	-	-	165-210
R640	≥2-30	≥2-30	≥640	≥590	≥6	≥8	≥10	-
H180	≥2-30	≥2-30	-	-	-	-	-	180-230

Mechanical properties at room temperature (profiles und rectangular bars) acc. EN 12167

Temper	Dimensions		Tensile strength R_m	Proof strength $R_{p0,2}$	Elongation			Hardness
	profile[a)]	rectangular bar thickness			$A_{100\ mm}$	$A_{11,3}$	A	Brinell
		[mm]	[N/mm²]	[N/mm²	[%]	[%]	[%]	HBW
M	All	All	as manufactured, without defined mechanical properties					
R550	-	≥10-40	≥550	≥430	-	-	≥15	-
H150	-		-	-	-	-	-	150-190
R600	-	≥3-30	≥600	≥520	≥4	≥6	≥10	-
H165	-		-	-	-	-	-	165-210
R640	-	≥3-10	≥640	≥590	≥3	≥5	≥8	-
H180	-		-	-	-	-	-	180-230

[a)] The mechanical properties of profiles depend on the shape and dimensions of the profile and must be agreed between the buyer and supplier.

Mechanical properties at room temperature (tubes) acc. EN 12449

Temper	Wallthickness t [mm]	Tensil strength R_m [N/mm²]	Proof strength $R_{p0,2}$ [N/mm²]	Elongation A [%]	Hardness HBW	Hardness HV
M	≤20	as manufactured, without defined mechanical properties				
R260[c)]	≤10	≥260	≥60	≥30	-	-
H065[c)]		-	-	-	60-90	65-100
R460[d)]	≤10	≥460	≥300	≥12	-	-
H150[d)]		-	-	-	140-180	150-190
R380[a)]	≤10	≥380	≥260	≥6	-	-
H130[a)]		-	-	-	120-160	130-170
R600[b)]	≤10	≥600	≥480	≥6	-	-
H190[b)]		-	-	-	≥180	≥190

[a)] solution-annealed and cold formed

[b)] solution-annealed, cold formed and precipitation hardened

[c)] solution-annealed

[d)] solution-annealed and precipitation hardened

Mechanical properties at room temperature (sheets, strip and plates) acc. EN 1652

Temper	Thickness t [mm]	Proof strength $R_{p0,2}$ [N/mm²]	Tensile strength R_m [N/mm²]	Elongation $A_{50\ mm}$ for thickness of 0,1 mm to 2,5 mm [%]	Elongation A for thickness > 2,5 mm [%]	Hardness HV
R260[c)]	1-10	(≥60)[e)]	≥260	≥28	-	-
H070[c)]		-	-	-	-	70-100
R490[d)]	1-10	(≥340)[e)]	≥490	11	-	-
H140[d)]		-	-	-	-	140-190
R450[a)]	0,6-3	(≥360)[e)]	≥450	≥2	-	-
H130[a)]		-	-	-	-	130-180
R640[b)]	0,6-3	(≥590)[e)]	≥640	8	-	-
H170[b)]		-	-	-	-	170-220

[a)] solution-annealed and cold formed

[b)] solution-annealed, cold formed and precipitation hardened

[c)] solution-annealed

[d)] solution-annealed and precipitation hardened

[e)] The figures in brackets are not requirements of this standard, but are provided for information purposes only.

Reference data for some physical properties (for guidance only)

Density at 20 °C [kg/dm³]	Electrical conductivity [MS/m]	Thermal conductivity [W/m·K]	Specific heat capacity [J/Kg·K]	Young's modulus [MPa]	Shear modulus [MPa]
8,8	17,0	-	-	135000	-

Guidance on the temperatures for hot forming and heat treatment

Soft annealing temperature	Stress-relieving annealing temperature	Hot forming temperature
-	350-450 °C	800-950 °C

Processing/Welding

In the solution-annealed condition the material has a very good hot and cold formability. Cold formability becomes more difficult as hardening increases. Furthermore, CW111C is well suitable for welding and brazing. The machinability of this material is rated as moderate to difficult. Machinability improves with increasing mechanical strength.

Remark

The material is compliant to RoHS and REACH.

Editor

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Reference

DIN EN 1652:1998-03	Beuth Verlag GmbH, Postfach, D-10772 Berlin
DIN EN 12163:2025-02	
DIN EN 12167:2016-11	
DIN EN 12449:2019-12	
Copper Material Data Sheets	Deutsches Kupferinstitut Berufsverband e.V. D-40239 Düsseldorf

Important note

Information given in this data sheet about the condition or usability of materials respectively products are no warranty for their properties, but act as a description.

The information we give on for advice complies to the experiences of the manufacturer as well as our own. We cannot give warranty for the results of processing and application of the products.