

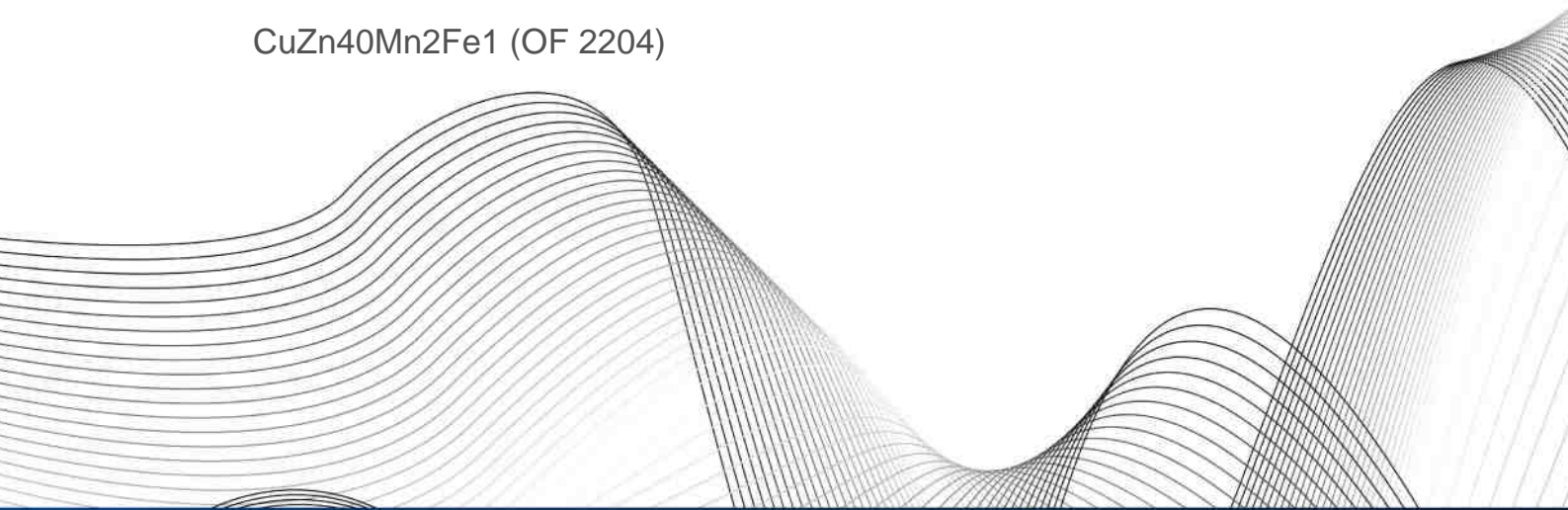


OTTO FUCHS
Dülken GmbH & Co. KG



Copper and Copper Alloys

CuZn40Mn2Fe1 (OF 2204)





	Cu	Zn	Pb	Sn	Fe	Mn	Ni	Al	Si	As	Co	Cr	Others
min.	56.5	Rem.	-	-	0.5	1.0	-	-	-	-	-	-	-
max.	58.5	-	0.5	0.3	1.5	2.0	0.6	0.1	0.1	-	-	-	0.4

Applications

CuZn40Mn2Fe1 (bronze for architecture) is highly suitable for use in architecture and metal construction. Due to the formation of a patina in a natural environment OF 2204 provides a good resistance to weathering.

Examples of application:

Parts for construction
Parts for apparatus construction
Profiles for architecture
Hand rails
Linings

Physical properties

At room temperature

Density	8.3	g/cm ³
Electrical conductivity	8.6	MS/m
	14.8	% I.A.C.S
Heat conductivity	67	W/(m*K)
Heat capacity	377	J/(kg*K)
Coefficient of thermal expansion	18.5	10 ⁻⁶ /K
Young's modulus	100	GPa
Melting range	880-890	°C

Microstructures

The microstructures of CuZn40Mn2Fe1 consist of a heterogeneous mixture of α - and β -phase. Within the brass matrix Mn-Fe-silicides are embedded. Pb is insoluble in the brass matrix and forms fine precipitates improving the machinability of the alloy.



Consignment and measurements

Strength conditions

Spec./ DIN EN	Condition	Yield strength $R_{p0.2}$ [MPa]	Tensile strength R_m [MPa]	Elongation at break A [%]	Brinell- Hardness HB 2.5/62.5
12449 {12163}/{12167}	M	**	**	**	**
12449	R440	≥ 170	≥ 440	≥ 15	/
12449	R490	≥ 270	≥ 490	≥ 10	/
12449	H115	/	/	/	110-150
12449	H135	/	/	/	≥ 130

DIN EN 12163:
Bars, general purpose

DIN EN 12167:
Profiles, rectangular bars

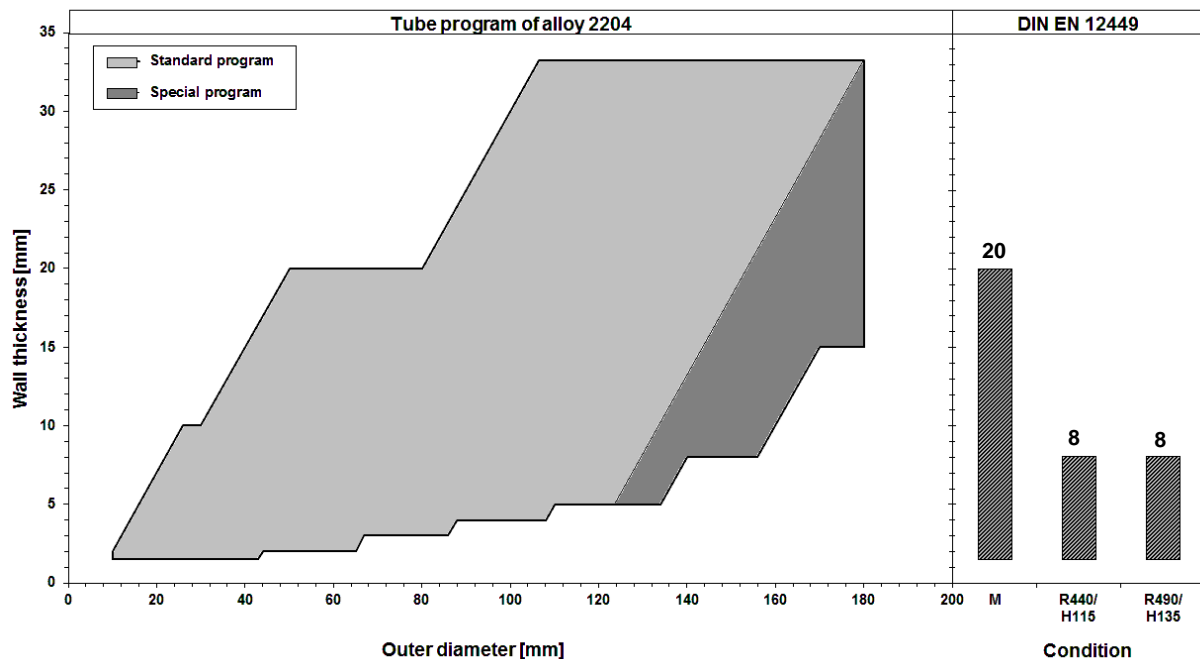
DIN EN 12449:
Seamless tubes

- ** Condition M = without specified mechanical properties - as manufactured
- / No requirements in standard or not applicable
- { } The alloy is not in this standard - delivery on special terms

Bars

Profiles and rectangular bars can be delivered up to 180 mm in extruded condition.

Specified dimensions for hollow bars and round tubes



Further dimensions for hollow bars and round tubes are dependent upon each individual case.

Other consignments

Rods and tubes in other strength or hardness conditions and dimensions are dependent upon each individual case.



Processing		Heat treatment	
Shaping		Soft annealing	500-650°C
Machinability (CuZn39Pb3=100%)	average (50)	Stress relieving	200-380°C
Cold working	average	Special notes and remarks	
Hot working	good		
Hot working temperature	650-750°C	There is a risk of stress corrosion cracking (SCC) in case of concurrent presence of mechanical stress and corrosive media (in particular ammoniac atmosphere).	
Connecting			
Resistance welding	average		
Shielded welding	average		
Brazing	good		
Soldering	very good		
Surface treatment			
Mechanical polishing	very good		
Electrolytic polishing	poor		
Galvanisation	good		
Tin coating	-		

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