

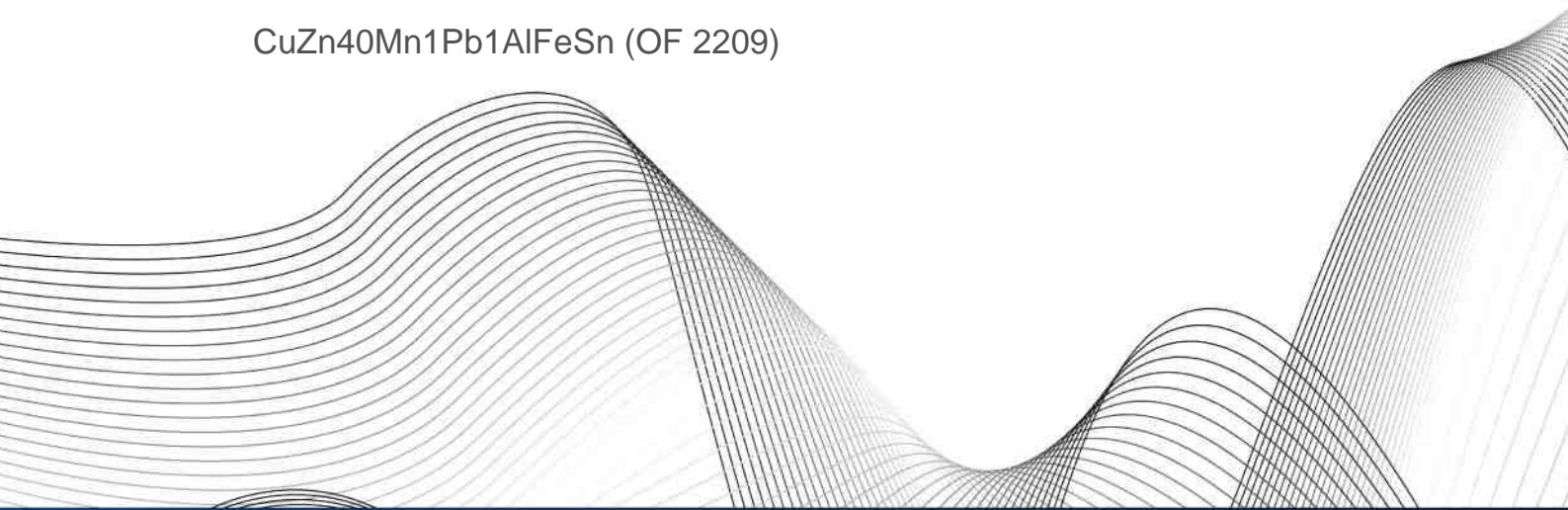


OTTO FUCHS
Dülken GmbH & Co. KG



Copper and Copper Alloys

CuZn40Mn1Pb1AlFeSn (OF 2209)



	Cu	Zn	Pb	Sn	Fe	Mn	Ni	Al	Si	As	Co	Cr	Others
min.	57.0	Rem.	0.8	0.2	0.2	0.8	-	0.3	-	-	-	-	-
max.	59.0	-	1.6	1.0	1.2	1.8	0.3	1.3	-	-	-	-	0.3

Applications

CuZn40Mn1Pb1AlFeSn is a special alloy combining reasonable mechanical strength and good corrosion resistance. Due to this combination of properties OF 2209 is highly suitable for use in architecture and metal construction, apparatus construction and mining. OF 2209 is also very good for machined parts.

Examples of application:

Extruded profiles, e.g. for architecture
Hand rails
Linings
Parts for construction
Parts for apparatus construction
Tubes for valves
Parts for mining

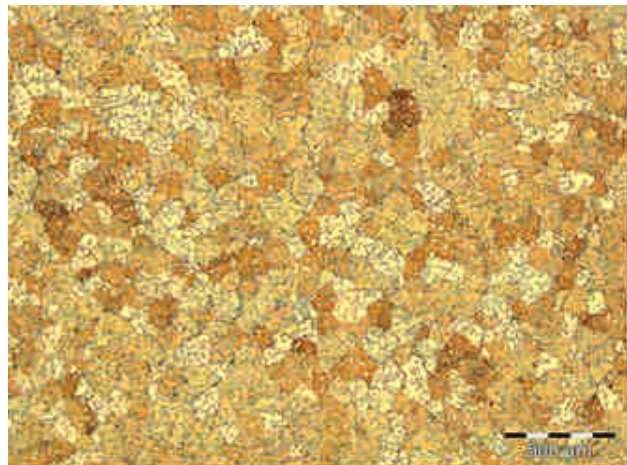
Physical properties

At room temperature

Density	8.3	g/cm ³
Electrical conductivity	9	MS/m
	15.5	% I.A.C.S
Heat conductivity	88	W/(m*K)
Heat capacity	377	J/(kg*K)
Coefficient of thermal expansion	20	10 ⁻⁶ /K
Young's modulus	96	GPa
Melting range	860-910	°C

Microstructures

The microstructures of CuZn40Mn1Pb1AlFeSn consist of a heterogeneous mixture of α - and β -phase. Mn-Fe-silicides are embedded within the brass matrix. 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
12164/12165/ 12167/12168/ 12420	M	**	**	**	**
12164/12167/ 12168	R440	≥180	≥440	≥20	/
12164/12167/ 12168	R500	≥270	≥500	≥12	/
12164/12167/ 12168	H100	/	/	/	100-140
12420		(≥180)	(≥440)	(≥15)	≥100
12165	H120	/	/	/	120-180
12164/12167/ 12168	H130	/	/	/	≥ 130

DIN EN 12164:
Bars for machining

DIN EN 12165:
Pre-material for forging

DIN EN 12167:
Profiles, rectangular bars

DIN EN 12168:
Hollow bars for machining

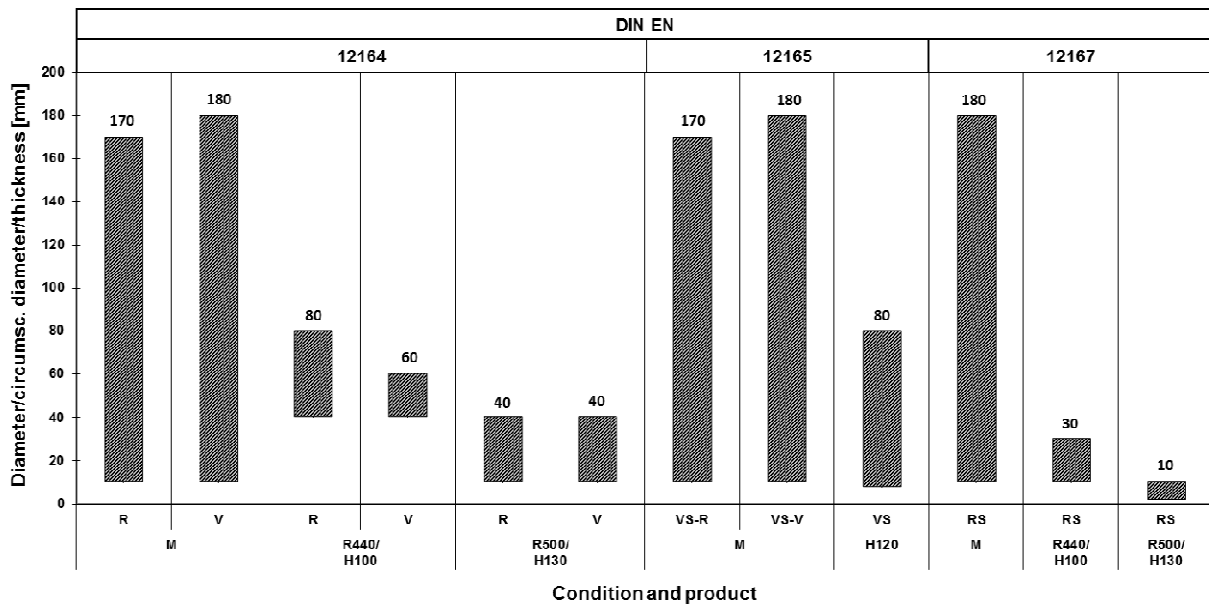
DIN EN 12420:
Forgings

** 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

Specified dimensions for bars, pre-material for forging and forgings



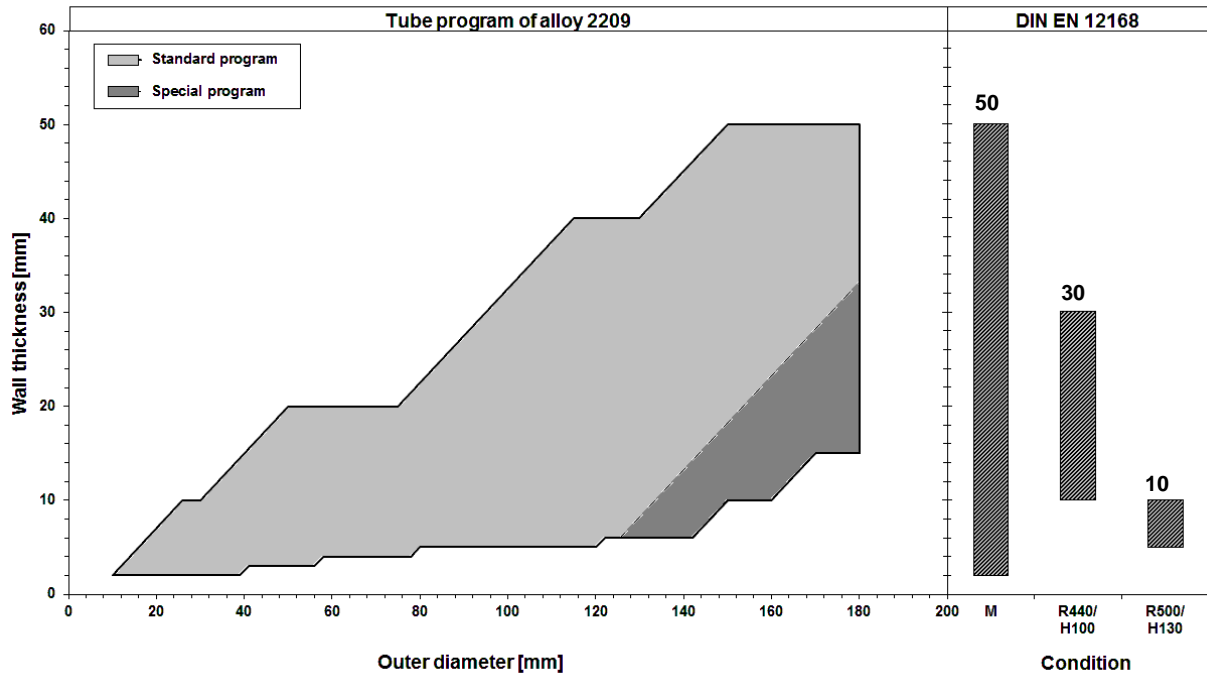
R/V Rod/Polygonal bars

VS-R/V Pre-material for forging round/polygonal

RS Rectangular bar

Profiles and rectangular bars can be delivered up to 180 mm in extruded condition. Pre-material for forging and forgings is dependent upon each individual case.

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	500-600°C
Machinability (CuZn39Pb3=100%)	good (70)	Stress relieving	350-450°C
Cold working	poor	Special notes and remarks	
Hot working	good		
Hot working temperature	625-750°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	average		
Soldering	poor		
Surface treatment			
Mechanical polishing	very good		
Electrolytic polishing	poor		
Galvanisation	average		
Tin coating	-		

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