

# Alloys

Material Designation		Composition in % (m/m)								
Symbolic	Numerical	Element	Cu	Ag	Bi	O	P	Pb	Other elements (see note)	
									Total	excluded
Cu-ETP	CW004A	min.	99.90 <sup>a</sup>	–	–	–	–	–	–	Ag, O
		max.	–	–	0,0005	0.040 <sup>b</sup>	–	0,005	0,03	
Cu-FRHC	CW005A	min.	99.90 <sup>a</sup>	–	–	–	–	–	–	Ag, O
		max.	–	–	–	0.040 <sup>b</sup>	–	–	0,06	
Cu-OF	CW008A	min.	99.95 <sup>a</sup>	–	–	–	–	–	–	Ag
		max.	–	–	0,0005	– <sup>c</sup>	–	0,005	0,03	
CuAg0,04	CW011A	min.	Rest	0,03	–	–	–	–	–	Ag, O
		max.	–	0,05	0,0005	0,040	–	–	0,03	
CuAg0,07	CW012A	min.	Rest	0,06	–	–	–	–	–	Ag, O
		max.	–	0,08	0,0005	0,040	–	–	0,03	
CuAg0,10	CW013A	min.	Rest	0,08	–	–	–	–	–	Ag, O
		max.	–	0,12	0,0005	0,040	–	–	0,03	
CuAg0,04P	CW014A	min.	Rest	0,03	–	–	0,001	–	–	Ag, P
		max.	–	0,05	0,0005	– <sup>c</sup>	0,007	–	0,03	

Material Designation		Composition in % (m/m)								
Symbolic	Numerical	Element	Cu	Ag	Bi	O	P	Pb	Other elements (see note)	
									Total	excluded
CuAg0,07P	CW015A	min.	Rest	0,06	–	–	0,001	–	–	Ag, P
		max.	–	0,08	0,0005	– <sup>c</sup>	0,007	–	0,03	
CuAg0,10P	CW016A	min.	Rest	0,08	–	–	0,001	–	–	Ag, P
		max.	–	0,12	0,0005	– <sup>c</sup>	0,007	–	0,03	
CuAg0,04(O <sup>F</sup> )	CW017A	min.	Rest	0,03	–	–	–	–	–	Ag, O
		max.	–	0,05	0,0005	– <sup>c</sup>	–	–	0,0065	
CuAg0,07(O <sup>F</sup> )	CW018A	min.	Rest	0,06	–	–	–	–	–	Ag, O
		max.	–	0,08	0,0005	– <sup>c</sup>	–	–	0,0065	
CuAg0,10(O <sup>F</sup> )	CW019A	min.	Rest	0,08	–	–	–	–	–	Ag, O
		max.	–	0,12	0,0005	– <sup>c</sup>	–	–	0,0065	
Cu-PHC	CW020A	min.	99.95 <sup>a</sup>	–	–	–	0,001	–	–	Ag, P
		max.	–	–	0,0005	– <sup>c</sup>	0,006	0,005	0,03	
Cu-HCP	CW021A	min.	99.95 <sup>a</sup>	–	–	–	0,002	–	–	Ag, P
		max.	–	–	0,0005	– <sup>c</sup>	0,007	0,005	0,03	
NOTE – The total of other elements ( different from copper) is defined as the sum of Ag, As, Bi, Cd, Co, Cr, Fe, Mn, Ni, O, P , Pb, S, Sb, Se, Si, Sn, Te and Zn, with the exclusion of any of the elements whose value is indicated individually.										
<sup>a</sup> Including silver (Ag), up to a maximum of 0.015%										
<sup>b</sup> Up to 0.060% of oxygen content is permitted, subject to an agreement between client and supplier.										

Material Designation		Composition in % (m/m)								
Symbolic	Numerical	Element	Cu	Ag	Bi	O	P	Pb	Other elements (see note)	
									Total	excluded
° Oxygen content must be such that the material complies with the requisites for embrittlement by heating in a hydrogen atmosphere as in Norm En 1976.										

**ALEACIONES. COMPOSICIÓN DEL Cu-OFE y Cu-PHCE según EN 13601**

Material Designation		Element	Composition in % (mass fraction)																
Symbolic	Numerical		Cu	Ag	As	Bi	Cd	Fe	Mn	Ni	O	P	Pb	S	Sb	Se	Sn	Te	Zn
<b>Cu-OFE</b>	CW009A	min.	99,99	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
		max.	–	0,002 5	0,000 5	0,000 20	0,000 1	0,0001 0	0,000 5	0,000 1	– <sup>a</sup>	0,000 3	0,000 5	0,001 5	0,000 4	0,000 20	0,000 2	0,000 20	0,000 1
<b>Cu-PHCE</b>	CW022A	min.	99,99	–	–	–	–	–	–	–	–	0,001	–	–	–	–	–	–	–
		max.	–	0,002 5	0,000 5	0,000 20	0,000 1	0,0001 0	0,000 5	0,000 1	– <sup>a</sup>	0,006	0,000 5	0,001 5	0,000 4	0,000 20	0,000 2	0,000 20	0,000 1

<sup>a</sup> The oxygen content must be such that the material fulfills requirements of fragilization by heating in a hydrogen atmosphere, of the Norm in 1976.