

SUPER PURE OXYGEN-FREE COPPER
Chemical composition and Purity of Grade "A+ " (extra)

SUPER PURE OXYGEN-FREE COPPER - Grade "A+ " (extra) according to GOST 859-2001, ASTM B 170.										
Method \ Impurity	LMS, AES				LMS+AES+SSMS *+GDMS * (mg/kg, ppm)					
	Grade "A+ " (extra)				Grade "A+ " (extra)					
	min		max	min	~	median	~	average	max	
1 O	≤	2	≤	2	≤	2	≤	2	≤	2
2 P	<	0.1	<	0.1	<	0.02	<	0.02	<	0.04
3 S	<	3	<	3	<	0.1	<	0.2	<	0.3
4 Mn	<	0.1	<	0.1	<	0.005	<	0.005	<	0.02
5 Fe	<	0.1		0.5	<	0.01	≤	0.1	≤	0.2
6 Ni	<	0.1	<	0.1	<	0.005	<	0.005	<	0.02
7 Zn	<	0.1	<	0.1	<	0.02	<	0.02	<	0.02
8 As	<	0.1	<	0.1	<	0.02	<	0.02	<	0.02
9 Se	<	0.2	<	0.2	<	0.02	<	0.05	<	0.1
10 Ag	<	0.1		0.8	<	0.01	≤	0.1	≤	0.3
11 Cd	<	0.2	<	0.2	<	0.005	<	0.005	<	0.02
12 Sn	<	0.2	<	0.2	<	0.02	<	0.02	<	0.02
13 Sb	<	0.2	<	0.2	<	0.02	<	0.02	<	0.02
14 Te	<	0.2	<	0.2	<	0.02	<	0.02	<	0.02
15 Pb	<	0.2	<	0.2	<	0.005	<	0.005	<	0.02
16 Bi	<	0.2	<	0.2	<	0.005	<	0.005	<	0.02
<i>Fe + Ag</i>			≤	0.8					≤	0.85
Oxygen is measured "not more 2 ppm" - a limit of the equipment , oxygen can be < 1 ppm and < 0.1-0.5 ppm.										
% wt	max		min	max	~	median	~	average	min	
Cu	≥	99.9993	≥	99.9992	≥	99.9998	≥	99.9997	≥	99.9997
Cu + S	≥	99.9996	≥	99.9995	≥	99.9998	≥	99.9998	≥	99.9997
<i>Cu + Ag</i>	≥	99.9993	≥	99.9993	≥	99.9998	≥	99.9998	≥	99.9997
Cu + S + Ag	≥	99.9996	≥	99.9996	≥	99.9998	≥	99.9998	≥	99.9997
Cu+O	≥	99.9995	≥	99.9994	≥	99.99997	≥	99.99994	≥	99.99991
Cu+O + S	≥	99.9998	≥	99.9997	≥	99.99998	≥	99.99996	≥	99.99993
<i>Cu+O + Ag</i>	≥	99.9995	≥	99.9995	≥	99.99997	≥	99.99995	≥	99.99994
Cu+O + S + Ag	≥	99.9998	≥	99.9998	≥	99.99998	≥	99.99997	≥	99.99996
+ According to Metals basis (All metals : > 60)										
% wt	max		min	max	~	median	~	average	min	
<i>Cu</i>	≥	99.999	≥	99.999	≥	99.99996	≥	99.99994	≥	99.99991
<i>Cu + Ag</i>	≥	99.999	≥	99.999	≥	99.99996	≥	99.99995	≥	99.99994

* Results are not for the best measurement, but for the sufficiently qualified measurement. Results are for lots. The buyer can specify the additional requirements if it is possible to measure it. Basic methods are LMS, AES. P.S. Limits of sensitivity " < x - < 0.00x " of the equipment/methods are considered at calculation of purity as **corresponding number/quantity of impurity !**

SUPER PURE OXYGEN-FREE COPPER
Chemical composition and Purity of Grade " A " (basic)

SUPER PURE OXYGEN-FREE COPPER - Grade " A " (basic) according to GOST 859-2001, ASTM B 170.											
Impurity	Method \	LMS, AES		LMS+AES+SSMS *+GDMS * (mg/kg, ppm)							
		Grade " A " (basic)		Grade " A " (basic)							
		min	max	min	~	median	~	average	max		
1	O	≤	2	≤	2	≤	2	≤	2		
2	P	<	0.1	<	0.1	<	0.02	<	0.05		
3	S	<	3	<	3	<	0.1	<	0.4		
4	Mn	<	0.1	<	0.1	<	0.005	<	0.02		
5	Fe	<	0.1	1	<	0.01	≤	0.3	<	0.4	1
6	Ni	<	0.1	<	0.1	<	0.005	<	0.005	<	0.02
7	Zn	<	0.1	<	0.1	<	0.02	<	0.02	<	0.02
8	As	<	0.1	<	0.1	<	0.02	<	0.02	<	0.02
9	Se	<	0.2	<	0.2	<	0.02	<	0.05	<	0.1
10	Ag	<	0.1	2	<	0.01	≤	0.6	<	0.8	2
11	Cd	<	0.2	<	0.2	<	0.005	<	0.005	<	0.02
12	Sn	<	0.2	<	0.2	<	0.02	<	0.02	<	0.02
13	Sb	<	0.2	<	0.2	<	0.02	<	0.02	<	0.02
14	Te	<	0.2	<	0.2	<	0.02	<	0.02	<	0.02
15	Pb	<	0.2	<	0.2	<	0.005	<	0.005	<	0.02
16	Bi	<	0.2	<	0.2	<	0.005	<	0.005	<	0.02
	<i>Fe + Ag</i>		≤	2.7					≤	2.7	
Oxygen is measured "not more 2 ppm" - a limit of the equipment , oxygen can be < 1 ppm and < 0.1-0.5 ppm.											
% wt		max	min	max	~	median	~	average	min		
Cu		≥ 99.9993	≥ 99.9990	≥ 99.9998	≥	99.9997	≥	99.9996	≥ 99.9995		
Cu + S		≥ 99.9996	≥ 99.9993	≥ 99.9998	≥	99.9997	≥	99.9997	≥ 99.9995		
<i>Cu + Ag</i>		≥ 99.9993	≥ 99.9992	≥ 99.9998	≥	99.9997	≥	99.9997	≥ 99.9996		
Cu + S + Ag		≥ 99.9996	≥ 99.9995	≥ 99.9998	≥	99.9998	≥	99.9997	≥ 99.9997		
Cu+O		≥ 99.9995	≥ 99.9992	≥ 99.99997	≥	99.99987	≥	99.99984	≥ 99.99966		
Cu+O + S		≥ 99.9998	≥ 99.9995	≥ 99.99998	≥	99.99989	≥	99.99986	≥ 99.99970		
<i>Cu+O + Ag</i>		≥ 99.9995	≥ 99.9994	≥ 99.99997	≥	99.99993	≥	99.99992	≥ 99.99983		
Cu+O + S + Ag		≥ 99.9998	≥ 99.9997	≥ 99.99998	≥	99.99995	≥	99.99994	≥ 99.99987		
+ According to Metals basis (All metals : > 60)											
% wt		max	min	max	~	median	~	average	min		
<i>Cu</i>		≥ 99.999	≥ 99.999	≥ 99.99996	≥	99.99987	≥	99.99984	≥ 99.9997		
<i>Cu + Ag</i>		≥ 99.999	≥ 99.999	≥ 99.99996	≥	99.99993	≥	99.99992	≥ 99.9998		

* Results are not for the best measurement, but for the sufficiently qualified measurement. Results are for lots. The buyer can specify the additional requirements if it is possible to measure it. Basic methods are LMS, AES. P.S. Limits of sensitivity " < x - < 0.00x " of the equipment/methods are considered at calculation of purity as **corresponding number/quantity of impurity !**