[Document Name] CLAIMS

[Claim 1]
A cross-sectional structure of a pure copper alloy connecting wire composed of not higher than 0.02% by mass of a metal component other than copper (Cu) and the balance copper (Cu), characterized in that:
the composition of the wire includes not lower than 40 ppm by mass and lower than 100 ppm by mass (hereinafter, abbreviated as "40 to 100 ppm by mass") of at least one base metal of titanium (Ti), zirconium (Zr), zinc (Zn), and tin (Sn) and the balance copper (Cu) at purity of 99.990 to 99.996% by mass,
the cross-sectional structure of the wire has a drawn surface with the diameter reduced through a diamond die and, on all over the wire surface, an organic carbon layer with total organic carbon (TOC value) of 50 to 3,000 $\mu g/m^2$, and a copper oxide layer of 2 to 20 nm thick formed of copper oxide (Cu2-xO) containing unsaturated oxygen forms as the outermost layer of the wire, and base metal underneath the copper oxide layer remains without receiving internal oxidation.

[Claim 2]
The cross-sectional structure of a pure copper alloy connecting wire for ball bonding according to claim 1, characterized in that the metal component other than copper (Cu) contains 1 to 30 ppm by mass of silver (Ag) or 1 to 100 ppm by mass of phosphorus (P).

[Claim 3]

The cross-sectional structure of a pure copper alloy connecting wire for ultrasonic bonding according to claim 1, characterized in that, regarding the metal component, the total content of silver (Ag) and phosphorus (P) is greater than the total content of titanium (Ti), zirconium (Zr), zinc (Zn), and tin (Sn).

[Claim 4]
The cross-sectional structure of a pure copper alloy connecting wire for ultrasonic bonding according to claim 1, characterized in that the base metal is titanium (Ti) or zirconium (Zr).

[Claim 5]
The cross-sectional structure of a pure copper alloy connecting wire for ultrasonic bonding according to claim 1, characterized in that, regarding the metal component, the total content of silver (Ag) and/or phosphorus (P) is greater than the total content of titanium (Ti) and/or zirconium (Zr).

[Claim 6]
The cross-sectional structure of a pure copper alloy connecting wire for ball bonding according to claim 1, characterized in that the connecting wire is a connecting wire for ultrasonic bonding.

[Claim 7]
The cross-sectional structure of a pure copper alloy connecting wire for ball bonding according to claim 1, characterized in that the connecting wire is a bonding wire for forming free air ball.

[Document Name] CLAIMS

[Claim 1]

A cross-sectional structure of a pure copper alloy connecting wire composed of not higher than 0.02% by mass of a metal component other than copper (Cu) and the balance copper (Cu), characterized in that:

the composition of the pure copper alloy connecting wire includes not lower than 40 ppm by mass and lower than 100 ppm by mass (hereinafter, abbreviated as "40 to 100 ppm by mass") of at least one base metal of titanium (Ti), zirconium (Zr), zinc (Zn), and tin (Sn) and the balance copper (Cu) at purity of 99.990 to 99.996% by mass,

the cross-sectional structure of the pure copper alloy connecting wire has a drawn surface with the diameter reduced through a diamond die and, on all over the pure copper alloy connecting wire surface, an organic carbon layer with total organic carbon (TOC value) of 50 to 3,000 $\mu g/m^2$, and

a copper oxide layer of 2 to 20 nm thick formed of copper oxide ($Cu_{2-x}O$) containing unsaturated oxygen forms as the outermost layer of the pure copper alloy connecting wire, and base metal underneath the copper oxide layer remains without receiving internal oxidation.

[Claim 2]

The cross-sectional structure of a pure copper alloy connecting wire according to claim 1, characterized in that the metal component other than copper (Cu) contains 1 to 30 ppm by mass of silver (Ag) or 1 to 100 ppm by mass of phosphorus (P), and the said pure copper alloy connecting wire is a bonding wire for ball bonding.

[Claim 3]

The cross-sectional structure of a pure copper alloy connecting wire according to claim 1, characterized in that, regarding the metal component other than copper (Cu), the total content of silver (Ag) and phosphorus (P) is greater than the total content of titanium (Ti), zirconium (Zr), zinc (Zn), and tin (Sn), and the said pure copper alloy connecting wire is a bonding wire for ultrasonic bonding.

[Claim 4]
The cross-sectional structure of a pure copper alloy connecting wire according to claim 1, characterized in that the base metal is titanium (Ti) or zirconium (Zr), and the said pure copper alloy connecting wire is a bonding wire for ultrasonic bonding.
[Claim 5]
The cross-sectional structure of a pure copper alloy connecting wire according to claim 1, characterized in that, regarding the metal component other than copper (Cu), the total content of silver (Ag) or phosphorus (P) is greater than the total content of titanium (Ti) or zirconium (Zr), and the said pure copper alloy connecting wire is a bonding wire for ultrasonic bonding.
[Claim 6]
The cross-sectional structure of a pure copper alloy connecting wire according to claim 1, characterized in that the said pure copper alloy connecting wire is a bonding wire for ultrasonic bonding.
[Claim 7]
The cross-sectional structure of a pure copper alloy connecting wire according to claim 1, characterized in that the said pure copper alloy connecting wire is a bonding wire for forming free air ball.