

Copper-Phosphorus CuP

Copper based master alloys



Application

Copper-Phosphorus master alloys are commonly used for the deoxidation of copper and copper alloys. Although other deoxidants exist, phosphorus has proven to be the most economical.

Copper-Phosphorus master alloys are also used as an alloying agent to obtain a certain level of phosphorus in copper alloys, such as phosphor bronze and various brazing alloys. It is commonly added to increase the fluidity of the metal.

In the aluminium industry CuP8% is used for treating hypereutectic AISI foundry alloys to control the size and morphology of the solidifying primary silicon phase. This increases the toughness, wear resistance and machinability of the alloy.

When CuP is used for deoxidation purposes it is common practice, particularly during the casting process, to aim for a residual phosphorus level of 0.010 to 0.015 % to prevent reoxidation.

CuP is an effective deoxidant for copper-tin, copper-tin-zinc and copper-lead-tin casting alloys. How-

ever, it is not suitable for the deoxidation of high conductivity copper, as phosphorus is detrimental to electrical conductivity. CuP is also unsuitable for copper-nickel alloys because phosphorus leads to the formation of a low melting phase which causes grain boundary embrittlement.

Product description

CuP is available in the form of waffle plates of approximately 12-18 kg unit weight and in the form of shot. The ingots are stacked on wooden pallets, the shot is packed in steel drums. Each pallet carries a label showing the batch number and nominal alloy composition.

Recommended addition practice

- Remove all dross from the bath surface.
- Add the required amount of master

alloy to the bath at normal operating temperatures

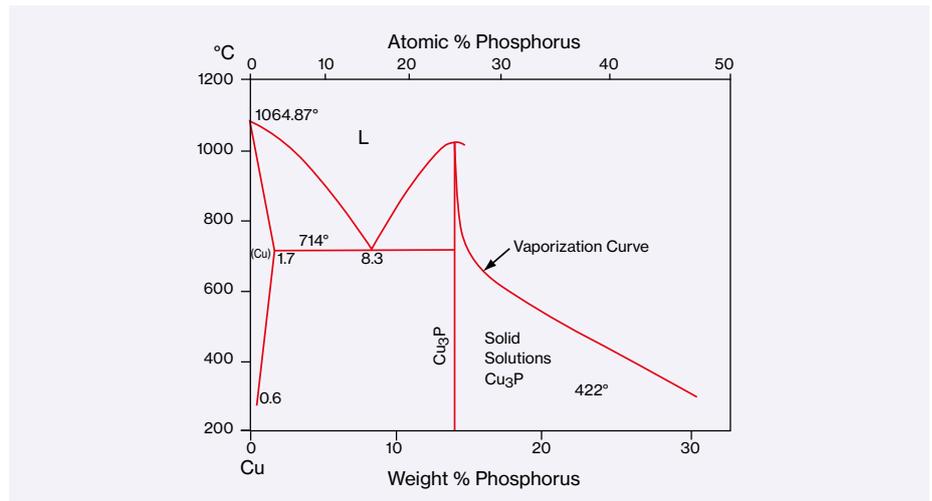
- Stir the bath well to ensure complete and homogeneous dissolution.
- A protective cover of charcoal or graphite may be useful.
- Start casting immediately as phosphorus tends to fade.

Storage

The CuP master alloy must be stored in a dry area to prevent oxidation. Reaction with humidity from the air will show as bluish crystals on the product surface.

PHYSICAL PROPERTIES

Master alloy	CuP 8%	CuP 10%	CuP 15%
Melting point (°C)	714	850	1020



COMPOSITION (WEIGHT%)

Master alloy	P	Al max	As max	Bi max	Fe max	Mn max	Ni max	Pb max	Sb max	Se max	Si max	Sn max	Te max	Zn max	Others each max	Others total max
CuP8 (A)	7.5 - 8.5	0.02	0.01	0.005	0.10	0.10	0.10	0.03	0.01	0.005	0.05	0.05	0.005	0.05	0.05	0.30
CuP8 (B)	7.5 - 8.5	-	-	-	0.20	-	0.20	0.20	-	-	-	0.20	-	0.20	0.10	0.50
CuP10 (A)	9.5 - 11.0	0.02	0.01	0.005	0.10	0.10	0.10	0.03	0.01	0.005	0.05	0.05	0.005	0.05	0.05	0.30
CuP10 (B)	9.5 - 11.0	-	-	-	0.20	-	0.20	0.20	-	-	-	0.20	-	0.20	0.10	0.50
CuP15 (A)	13.5 - 15.0	0.02	0.01	0.005	0.10	0.10	0.10	0.03	0.01	0.005	0.05	0.05	0.005	0.05	0.05	0.30
CuP15 (B)	13.5 - 15.0	-	-	-	0.10	-	0.10	0.10	-	-	-	0.10	-	0.10	0.10	0.40
CuP15 (C)	13.5 - 15.0	-	-	-	0.20	-	0.20	0.20	-	-	-	0.20	-	0.20	0.10	0.50

Derived from specification EN 1981:2003
Other composition, form and packaging upon request.

Material Safety Data Sheet available.

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- subject to change without notification -

