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CHEMICAL ACTIVE COATED RODS USED FOR BRAZING

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Brazing copper or copper-steel structures imposes measurements regarding deposits and base materials, as well as gas content, hydrogen and oxygen that come from the deoxidizing coat.

We developed a precursor, type 48%Cu–47%Sn–4%P–1%Si, powder, grain size 0.05mm. The product was used, with a participation of 8% of the total coating mass, at manufacturing, by extruding the new copper brazing rods or the copper-steel semi-products. We defined and produced deep joints, type copper-copper and low alloyed steel-copper. We defined and produced deep joints, type copper-copper and low alloyed steel-copper.

Mineral Composition [mass %]

Powder addition from silver ecological materials, grain size max. 0,1 mm as well as a mass participation up to 5 % sort B-Ag40CuZnSn – 670/710 according to EN ISO 3677:1995,	
Boric frit (boric glass).....	35 %;
Mechanical homogenized mixture- potassium hydroxide.....	26 %;
Fluoride frit (fluoride glass).....	20 %;
Plasticizer (CMC) carboxyl-methylcellulose.....	1 %;
Binder (distilled water).....	13 %.

Analysing the data introduced in the system in the first stage in relation to requirements stated in the preamble, highlighted the need to develop the innovative solution patented in RO125836. The product recipe as well as adjustments to the contents of the constituent materials of the rod and deoxidizer flux. To activate the coat we developed a new precursor with its chemical composition it was accomplished through casting and powder grinding, grain size maximum 0.05 mm. The manufactured rods were used for two homogenous joints (a) and two heterogeneous ones (b), type pipe in pipe,. For experiments we used two pipe dimensions, one of 6x1 mm, the other of 10x1 mm, currently used in the manufacturing industry of refrigerators. Testing the quality of joints was made on two samples, in longitudinal section, a homogeneous joint. and a heterogeneous joint.

Rod Chemical Composition

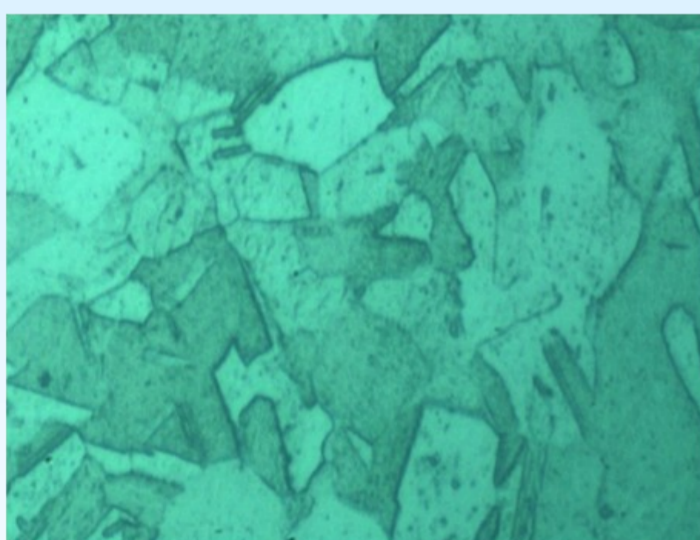
Chemical Composition [mass %]	Ag	Cu	Zn	Cd	Sn
Prescribes	24.0-26.0	39.0-41.0	31.0-35.0	--	1.5-2.5
Determined	25.0	40.0	33.0	--	2.0



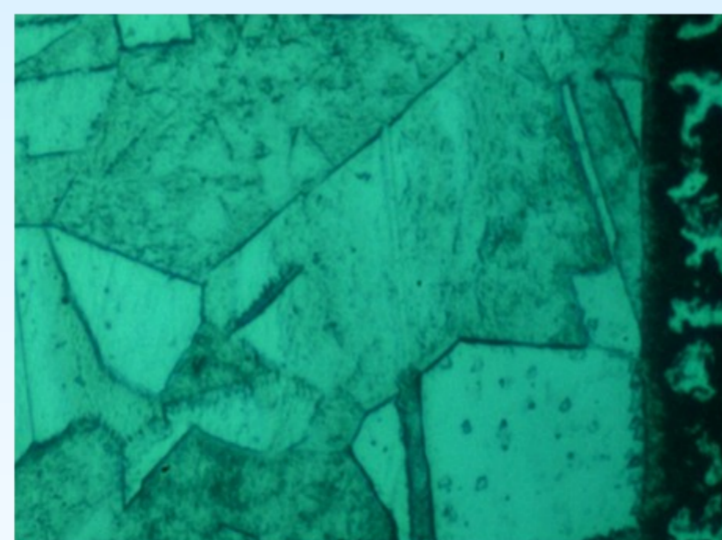
Deposited metal. Fine casting structure [100X]

Homogeneous joint, copper pipe in pipe type

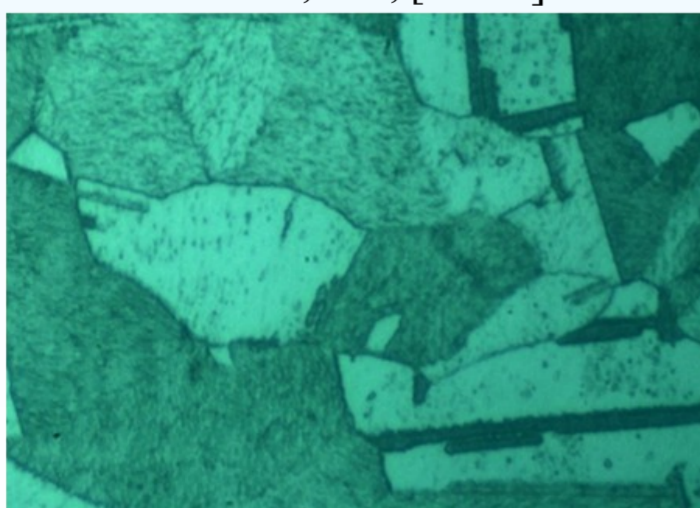
Heterogeneous joint, steel pipe in copper pipe type



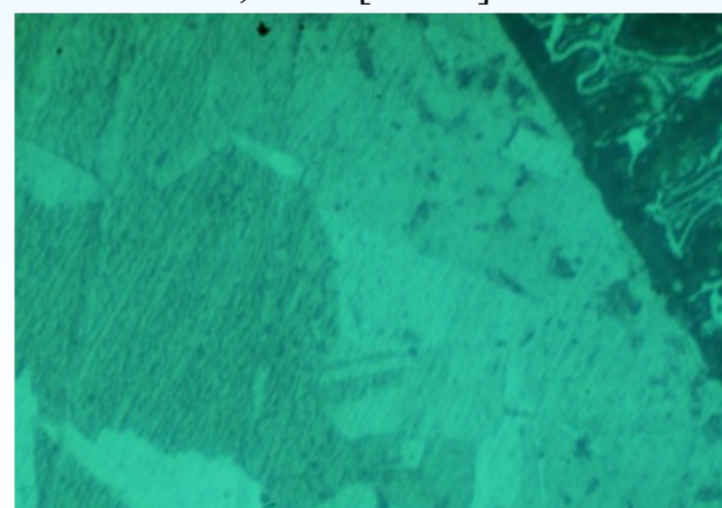
M1, BM, [500X]



M1, HAZ [500X]



M2, MB1, [500X]



M2, HAZ1, [500X]

Sample	Microscopic Examination SR EN 12797:2002; STAS 5500-74 [100X; 500X] Constituents SR 5000-97	Examined areas
M1	Solid solution α Cu-Zn, with oxide particles	BM
	Solid solution α Cu-Zn, with oxide particles	HAZ
	Fine Casting Structure	DM
M2	Solid solution α Cu-Zn, with oxide particles	BM1
	Solid solution α Cu-Zn, with oxide particles	HAZ1
	Fine Casting Structure	DM
	Ferrite and pearlite	HAZ2
	Ferrite and pearlite	BM2

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