



COATED RODS FOR BRAZED STRUCTURES USED IN HIGH SAFETY CONDITIONS

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Abstract: The paper presents research made in order to assure additional conditions, compared to those in general standard, to brazing rods, in order to guarantee safety to the environment and for the brazed joints, against corrosion and embrittlement, in high risk conditions.

Environmental safety is ensured by limiting the amount, at 0,25% in depositions, of dangerous residual elements at: Cd<0,1%; Hg<0,1%; Pb<0,1%; Cr<0,1%; As<0,1%.

The safety of the structures against corrosion is provided by the alloying level of depositions and by passivizing the coat's activity.

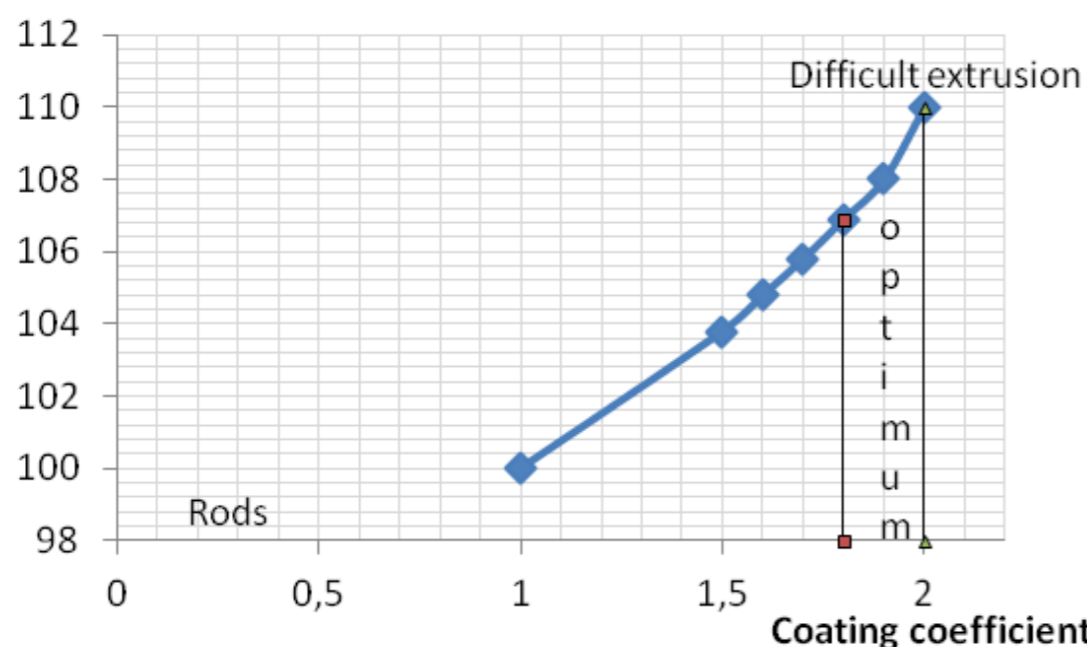
The structure safety towards the embrittlement of brazed joints is ensured by limiting the content of embrittling elements, namely: Sb+Fe+Bi at a maximum of 0.3% and the content of diffusible hydrogen at maximum 5 cm³/100g raw material and by limiting the coat humidity at maximum 10%.

The experiments were performed to ensure the set out requirements by following the selection of raw materials on the input criteria of prohibited chemicals, reducing the water content from elements that make up the coat and by diminishing it's hygroscopicity through passivation.

Prescribing additional conditions has an effect on manufacturing costs, which requires productivity increase at brazing, diminishing work temperature, increasing the moistening capacity of products, reducing the smoke level, effects pursued by the research.



Yield %



Deposition yield growth functions to coating coefficient.

The chemical composition of brazing alloys

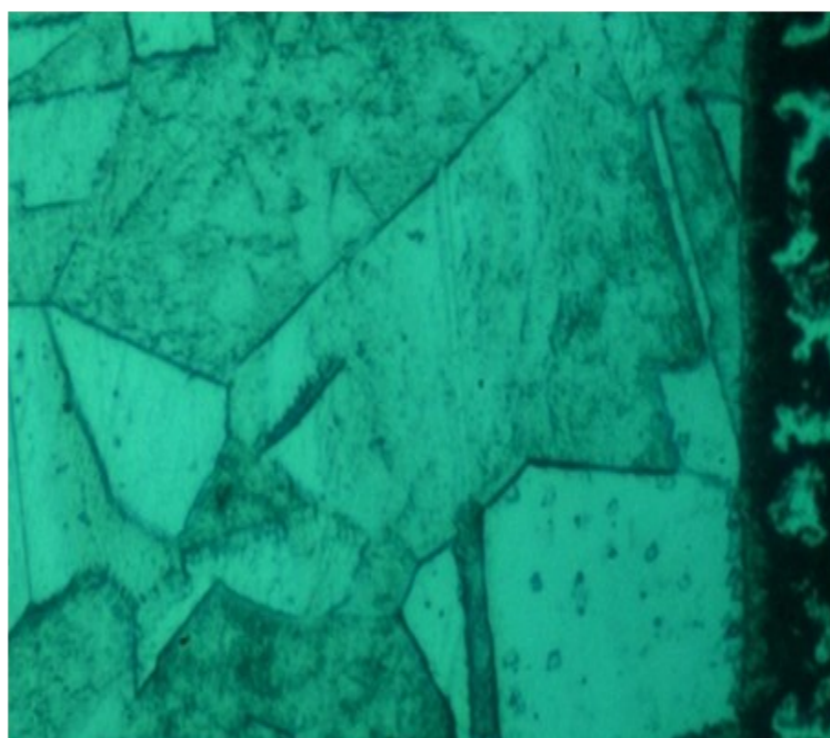
Chemical Composition [mass %]	Ag	Cu	Zn	Cd	Sn
AG106 Prescribed	33,0-35,0	35,0-37,0	25,5-29,5	Max.0,1	2,0-3,0
Determined	34,93	36,0	26,31	0,05	2,40
AG104 Prescribed	44,0-46,0	26,0-28,0	23,5-27,5	Max.0,1	2,0-3,0
Determined	45,0	27,10	25,02	0,05	2,52

Conclusions

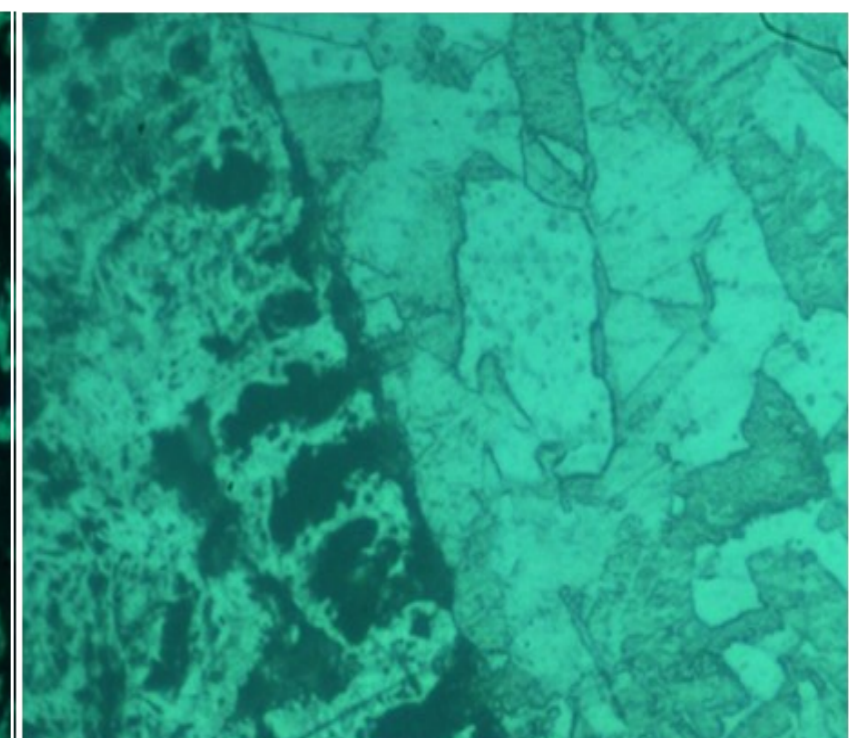
Research conducted resulted in manufacturing a new generation of coated rods for brazing, which deposit in the first stage a thin layer of AG104- that has a high capacity of diffusion into base materials; followed by a complementary layer of AG106.

The manufacturing process, experimental established, allows, by selecting the base material and technological operation, framing the new rods in environmental requirements of brazing processes.

Limiting embrittling elements in depositions reduces the cracking tendency of brazed joints, which assures improvement in safety in exploitation.



Experimental sample [attack E1, 500X]



Classic sample [attack E1, 500X]