Evoltion microstructurale et propriétés mécaniqued'un assemblage WC-Co/Ag-Cu-Zn et WC-Co/WC-W-Ni obtenu parsoudo-brasage

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Abstract: The performance of drilling tools in different conditions is strongly related to microstructural aspect of the hardfacing coating and to the good bonding between the PDC bits and the whole body. In the present work, the manual oxy-acetylene brazing process is employed for the AISI 1020 steel hardfacing using WC-Ni. The Substrate/hardfacing interface and it is performanceusing Ni-Cr-Al-Mo interlayer is particularly studied. The dissolution and the decarburization phenomena of WC particles with the formation of W2C eutectic phase and their effect on the decohesion of WC particles are investigated. On the other hand, and in order to join the PDC bits (WC-Co) to the steel whole body (AISI 1020) and to the matrix whole body of drilling tool (CMM), Sintering by infiltration of loose powder (SILP) process have been employed to elaborate the CMM via a metallic binder of bronze based alloy. Nevertheless, two brazing techniques have been adopted for joining WC-Co to steel and to MMC, the oxyacetylene brazing process, and for the first time, Tungsten Inert gas (TIG) brazing process using Ag based filler alloy.

Keywords : Infiltration; Brazing; Hardfacing, Interface, microstructure; mechanical properties