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DIFFUSION ANALYSES USING GDOES TECHNIQUE OF CHEMICAL ELEMENTS PRESENT ON 22MNB5 STEEL AND ALSI AND ZNNI COATINGS

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The hot stamping process consists to heat the steel blank at total austenitization temperatures and to transfer it into the press tooling for forming and fast cooling to fully martensitic transformation. This transference from furnace to press stage might promote some steel oxidation. The application of coatings avoids this phenomenon. The AlSi coating, a patented process, has been the most applied on steel. Hence, alternative coatings like ZnNi are under development. It is known that this furnace heating causes chemical elements diffusion that results in intermetallics formation in the coating and in the substrate. This study has the objective of analyse the diffusion profiles of chemical elements present in the substrate and coatings of AlSi and ZnNi using glow discharge optical emission spectroscopy technique (GDOES). The results showed that the diffusion of the elements Zn and Fe is the responsible for the formation of Zn-Fe phases for those samples coated using ZnNi, besides that in the AlSi sample the diffusion of Al and Fe elements control the formation of phases which consist in Al-Fe.