

# Caractérisation mécanique jonctions d'assemblables :acier inoxydable 304L /alliages de types ZY-4

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**Abstract:** In order to avoid or minimize the appearance of the harmful phases in the zone of diffusion of the works employed aiming at controlling the flow of diffusion of the chemical elements through the interface, although studies are undertaken, the nature of the compounds, the formation kinetics of certain phases and the number of zones formed at the interface in the temperatures of their practices, between 950-1100°C, remain controversial. The data related to the compromises between the operating parameters of the welding thermal cycle, in particular the temperature and the holding time of the isothermal bearing during a direct bond Zy4/steel are not very developed in the literature. The recent results obtained on the shape of the interface and the nature of the phases formed which will serve as a basis for the interpretation of the results which will be obtained and presented in the last chapter. The ZPR consists of three layers regardless of the holding temperature The CI ~ 4 to 6  $\mu$ m thick type - is located on the steel side. The thickness CII is practically independent of temperature, formed of a mixture of  $\gamma$ +Zr<sub>2</sub> phases between 950 and 1020°C and of  $\gamma$ +Zr phases for T=1050°C. Its thickness as well as its microstructure strongly depend on the holding temperature. The thickness of the ZPR evolves continuously up to 1020°C and increases drastically when T=1050°C . Results obtained from the evolution of the thickness of the reaction product zone as a function of residence time  $e=f$ , used to define the experimental parameters are used to select the thickness of the ZPR. During these steps the liquid fraction is gradually increasing and the thickness of CIII becomes drastically enlarged after 45 minutes of isothermal holding.

**Keywords :** diffusion of the chemical elements, harmful phases