

EVALUATION OF SPECTRAL RESPONSE IN THE AUSTENITIC STEEL ALLOY 10TiNiCr180

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Abstract: This paper analyzes the frequency spectrum of the ultrasonic response of the cryogenic material 10TiNiCr180 which is a stainless steel having an austenitic structure using a nondestructive method.

The frequency spectrum of the ultrasonic response obtained by PSD (Power Spectral Density) shows a prevalent austenitic structure in the base material and in the weld prevails a structure compound of austenite + ferrite + chromium carbide. Because SPR (Spectral Peak Ratio) was known, it was possible to determine the grain size which was compared with the one obtained by the metallographic analysis. The experimental measurements presented here were obtained by the direct contact method using silicon gel as the coupling medium with the pulse-echo technique, with a 5MHz transducer (Nortec). The instrumentation consisted of an IPR-100 signal generator, an A/D-90 converter and SMC-4 step by step motors from Physical Acoustic Corporation, a sampler and a spectral analyzer.

Key words: ultrasounds, peak frequency, PSD, SPR