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Comparison of selected rutile flux-cored wires stored under different environmental conditions

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Among the factors that affect the quality and properties of welded joints, an important role is played by the transportation and storage of consumables. Covered electrodes, flux-cored wires and fluxes are particularly vulnerable to harmful storage conditions. This work presents a comparative study between the effects of marine and land environmental conditions on 5 flux-cored wire grades with different design and produced by different manufacturing techniques. The wires, after storage under different climatic conditions, were subjected to visual, metallographic macro- and microscopic examinations, tensile tests as well as measurements of relative electrical resistance and diffusible hydrogen content in deposited metal. Differential effects of the storage environment on wire quality were found, and a correlation was noted between wire construction resulting from manufacturing technique and resistance to environmental factors. Storage of wires caused changes of mechanical properties and relative resistance, as well as an increase of diffusible hydrogen content from level H5 to a level exceeding H10. It was found that visual surface condition is not a good indicator of wire quality.