

## **Application of the Integrated Digital Image Correlation technique associated to Brazilian disc tests to identify the creep behavior of refractory materials**

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Refractory materials are well known for their temperature dependent nonlinear behavior. Particularly, at high temperatures, these materials present considerable creep strains, which can limit the lifetime of linings applied to metallurgical vessels. Therefore, viscoplastic constitutive models are often required to simulate the stresses and strains in practical applications. The identification of the mechanical material's parameters poses a major challenge to the refractories industry, specially under tensile loads, and it's frequently expensive and time consuming. In the present study, a new experimental setup based on the Integrated Digital Image Correlation (I-DIC) technique associated with Brazilian disc tests is proposed as an alternative to classic unidimensional tensile and compressive tests. The main advantage of this approach is the possibility to considerably reduce the number of required tests to identify the creep parameters, since in the Brazilian disc specimen the stress field is more complex than in unidimensional tests. The application of this technique has been exemplified through the identification of material's parameters related to different asymmetric creep constitutive models, i.e., models that present different behavior under tensile and compressive stress states.