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# Abrasion resistance characterization of low alloy construction steels: a comparison between three different scratch test protocols

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## Abstract:

In the present work, three different scratch tests are compared on their ability to rank the abrasion resistance of low alloy steels for industrial applications where the abrasion play a key role, e.g., in earthmoving, agricultural and mining equipment. The first test involves single pass scratching of pristine surfaces with a relatively large rigid indenter. The second test involves multi-pass scratching along a fixed track using the same large indenter. The third test involves the creation of a multi-pass scratch track using the same large indenter followed by final scratching of the abrasion track with a sharp indenter, i.e., Multi-Pass Dual Indenter (MPDI) scratch test. The three test protocols activate different abrasion mechanisms. Five low alloy construction steel grades with different strain hardening capabilities, i.e., Interstitial-free Ferritic steel (IF steel), Fully Martensitic steel (FM steel), Dual Phase steel (DP steel),

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