

## Effect of heating agent on scale formation of tool steels

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In order to heat steel without CO<sub>2</sub> emissions in the future, the burner technology of at least some of the furnaces used today will be converted from natural gas to hydrogen combustion. This poses a particular challenge for tool steel due to the more frequent heat treatments compared to engineering steel. The effect of the changed process gas on the furnace lining, temperature uniformity (TUS) and scale formation is being investigated in an EU-funded HYDREAMS project, among others.

A low-alloyed hot-work tool steel 1.2322, an alloyed hot-work tool steel 1.2344/H13, a ledeburitic cold-work tool steel 1.2379 and an aluminum-alloyed nitriding steel were each tested with natural gas/air and hydrogen/air heating.

Initial results from laboratory tests carried out at the University of Graz on tool steel samples from the Swiss Steel Group show that the qualitative formation of the scale layers does not change when the process gas is changed, but that there are significant differences in the kinetics. When steel is heated using hydrogen instead of natural gas, a significant increase in scaling is to be expected.

### Speaker Country

Germany

### Are you interested in publishing the paper in a Steel Research International special issue?

Yes

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