

OXIDE SCALES IN STEEL PRODUCTION

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Presentation for 0SE course

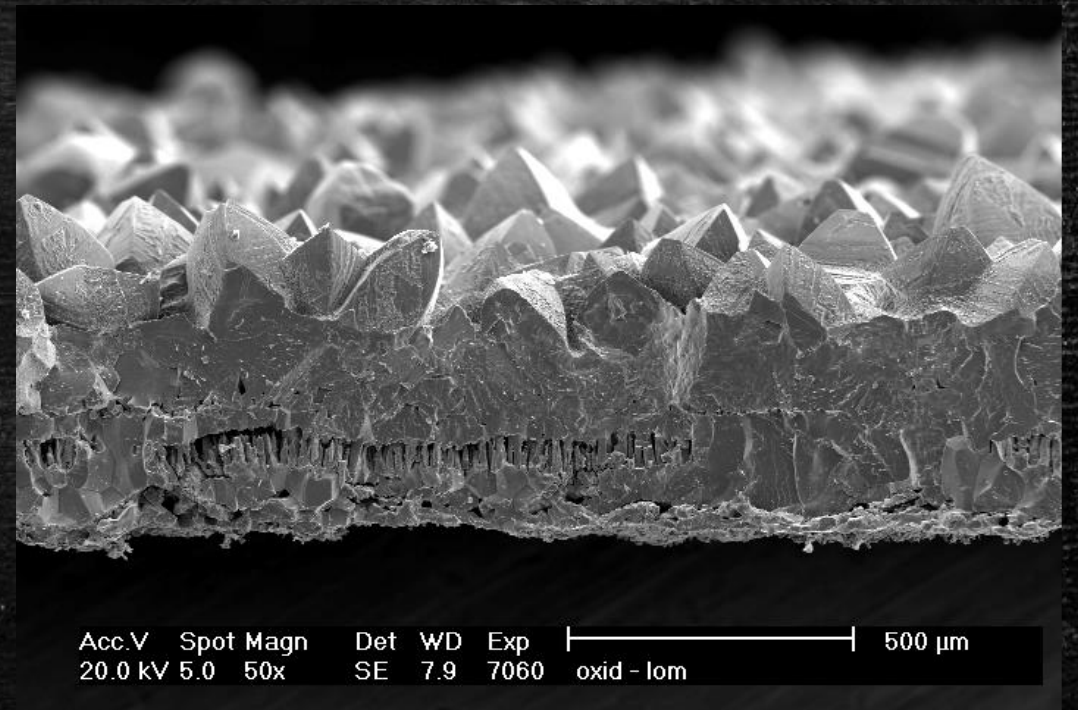
CONTENT

- Definition & Basic Characteristics
- Influence on Steel Production
- Possible Solutions

OXIDE SCALES



Hot rolled steel product covered with scale layer



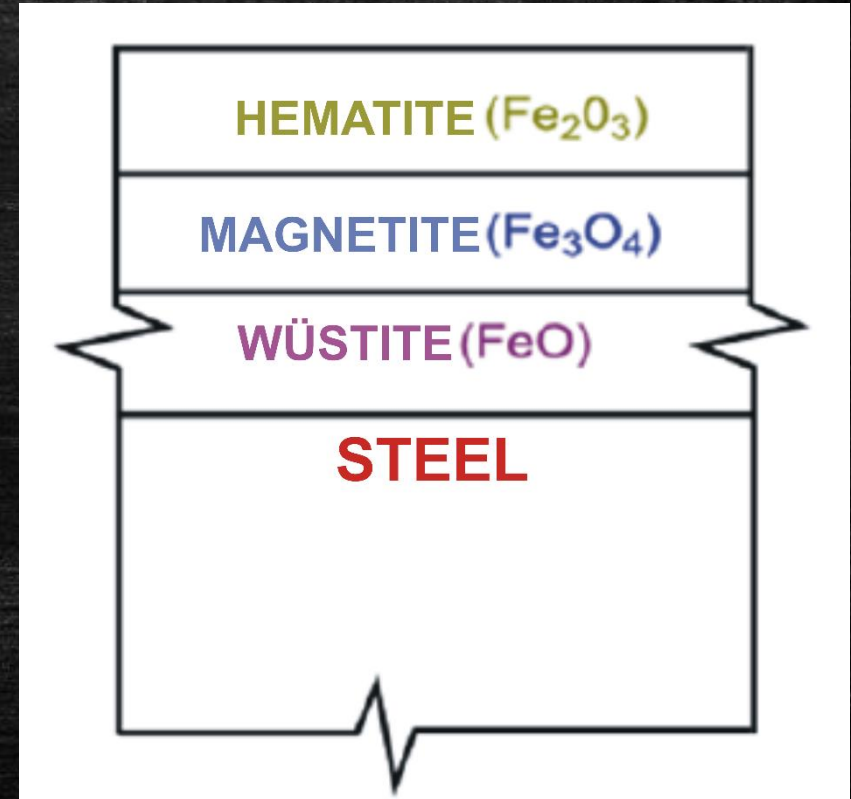
Electron microscope photo of a primary scale

STRUCTURE OF A SCALE LAYER

- Extensive variability due to
 - Oxidation time
 - Oxidation temperature
 - Steel additives



COMPLEX STRUCTURE



Chemical composition of a scale layer

SCALE LAYER VERSUS SPRAY COOLING

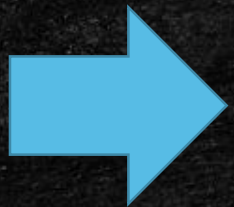
- Influence on heat treatment
- Optimization of cooling system
 - Higher steel quality
- Further research



Spray cooling of hot steel surface

SCALE LAYER VERSUS HOT ROLLING

- Influence on
 - Friction
 - Heat transfer
 - Tool wear
 - Steel surface quality



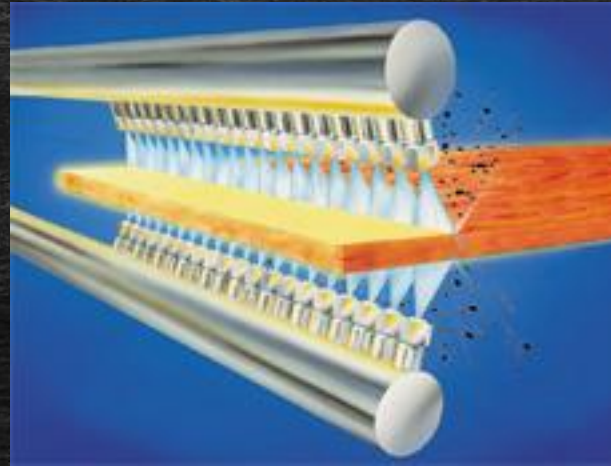
NEGATIVE IMPACT



Hot rolling of a steel product

HOW TO DEAL WITH OXIDE SCALES

- Descaling
 - Hydraulic
 - Mechanical
 - Chemical
- Optimization of processes
- Further research



Hydraulic descaling



Descaling nozzle test

Thank you for your attention!

More information: <http://www.heatlab.cz/>