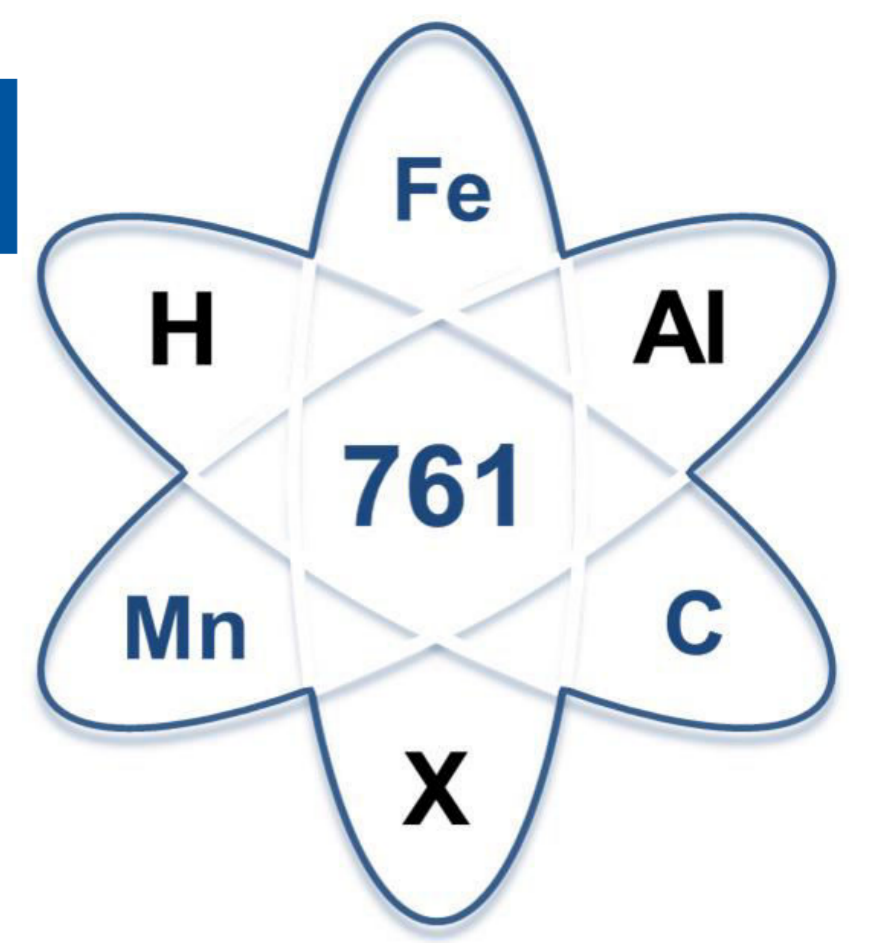


B6

Short process chain for semi-finished products

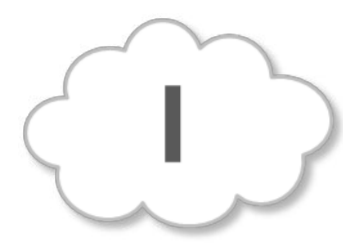
Short process chain for tailored semi-finished products



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Objectives 3rd Phase

Content



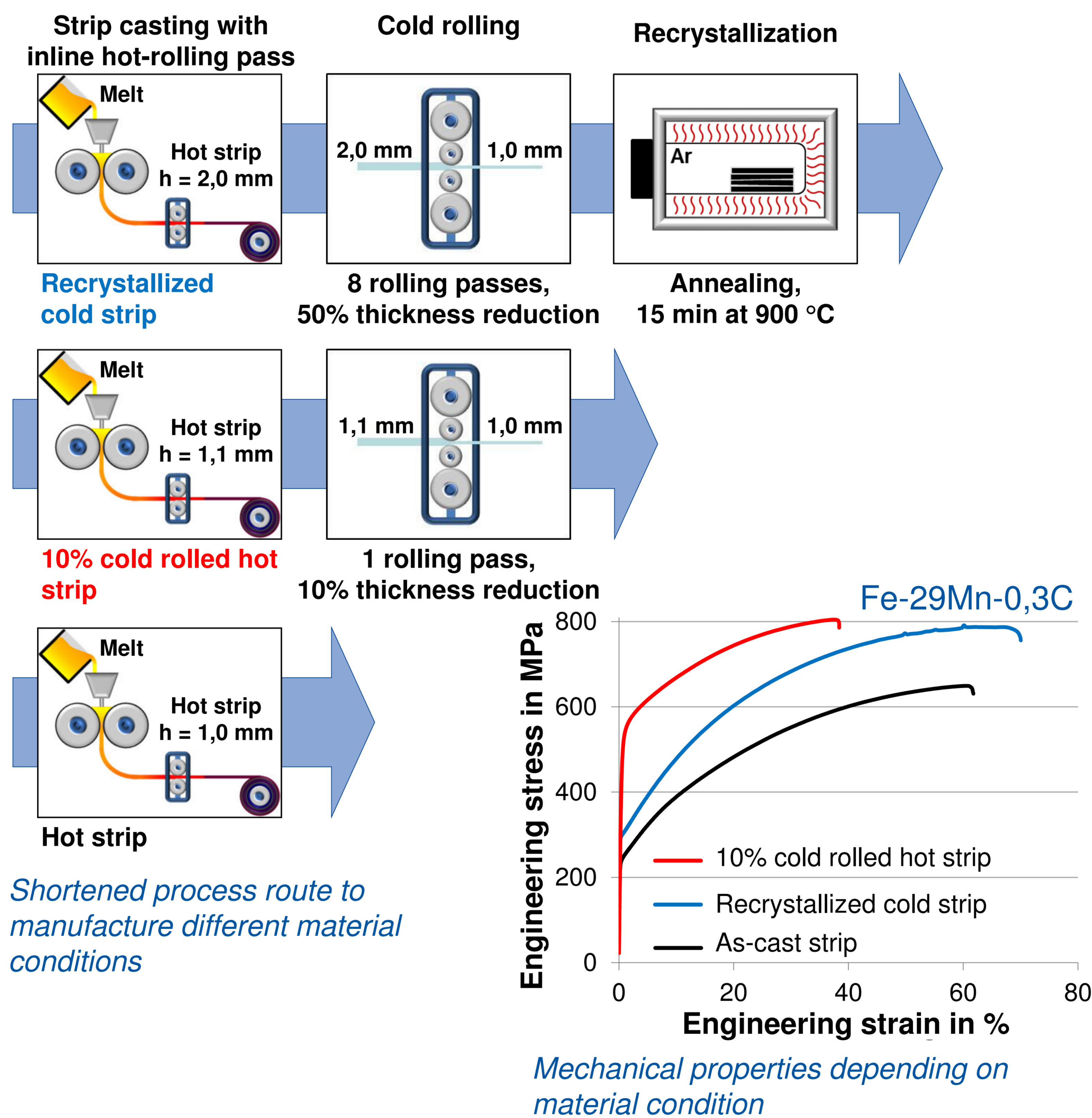
- Summarization of the whole process route of hot and cold strip manufacturing based on direct strip casting
- Adaptation to the extended alloy range of medium manganese and MBIP steels
- Production of cold strips with tailored properties via Strain Hardening Engineering
- Production of cold strips with tailored geometries

Methods

- Direct strip casting with inline processing
- Thermo-mechanical processing by cold rolling and annealing treatments
- Material modeling to design further processing steps
- Strip casting with contoured casting rolls

Input

- Thermodynamic data → TP A3
- 3D deformation-mechanism map → TP A5
- FEM-routine and Young's modulus data → TP A7
- Phase-field simulation of the solidification → TP A8
- Exchange regarding casting technology and solidification → TP B1
- Exchange regarding casting technology and processing of ingots → TP B1
- Sample material with adjusted properties → TP B2
- Sample material for characterization → TP C1, C2, C3, C6, C8
- Information about annealing parameters → TP B4
- Microstructure properties → TP C1
- Mechanical properties → TP C2, C3
- Damage behaviour → TP C6



Output

- Microstructure data for thermodynamic analysis → TP A3
- Experimental flow curves → TP A7
- Exchange regarding casting technology and processing of ingots → TP B1
- Sample material with adjusted properties → TP B2
- Sample material for characterization → TP C1, C2, C3, C6, C8

Objectives/Impact

- Production of multi-phase medium manganese steels and Al-alloyed high manganese steels with a shortened process route
- Process sequence to produce cold strip with tailored properties and adjusted thickness distribution over the strip width
- Analysis of the influence of the dendritic casting microstructure on the deformation mechanisms

Work packages

- AP1: Adaption of the production techniques to the extended material concepts:
 - Multi-phase medium manganese steels
 - Al-alloyed high manganese steels
- AP2: Production of semi-finished products with tailored properties and adjusted strip thickness distribution

