

Hüttenwerke Krupp Mannesmann GmbH (HKM) is an integrated iron and steel complex with an annual capacity of 5.4 million t of steel. Steel is produced here via the classical route of two LD converters and five secondary-metallurgical treatment stations, of which four are ladle (vacuum-tank) degassing units.

Round formats of 180-406 mm in diameter, TWIN slabs and wide slabs of 325 to 2100 mm in width are cast on five continuous casters.

The steelmaking plant's large range of casting grades, high rate of sequence casting and high material flow necessitate precise planning of secondary-metallurgical treatment. This is supported by an automatic treatment procedure (automatic treatment pattern), which is derived, via a rules data-base, from the steelmaking plant's computer and relayed to the control system for each unit. Not only improved predictability of treatment times, but also more uniform and more certain results on metallurgical criteria, also play a central role. The aim of the patterns is thus standardisation of treatment procedures on chronological and quality criteria.

The patterns are derived on the basis of plan data obtained from the target analyses of the heats. Each pattern is subdivided into five separate treatment operations. The heat is firstly adjusted during pre-treatment in such a way that final treatment under standardised starting conditions in terms of superheat temperature and oxidation state is possible. Finishing treatment, incorporating vacuum treatment, bubbling treatment and wire metallurgy, is followed by a concluding cleanliness treatment, if quality requirements necessitate this.

The patterns are implemented dynamically, in order to make it possible to react to the latest operating parameters and current steel composition during the pattern.

The patterns thus achieve transparent and more uniform treatment procedures. Around 25 % of all heats are currently produced in the steelmaking plant using automatic treatment patterns.

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