

mm, with the hot rolling ending at a hot rolling end temperature of $>A_{c3}-100^{\circ}\text{C}$. (Acs depending on the steel composition), followed by quenching (quench step) of the hot strip from the hot rolling end temperature at a cooling rate between 30 and 100 K/s to a quench temperature, with $RT < \text{quench temperature} < M_s + 100^{\circ}\text{C}$., where RT corresponds to room temperature and M_s is dependent on the steel composition and can be ascertained as follows: $M_s [^{\circ}\text{C}] = 462 - 273\% \text{C} - 26\% \text{Mn} - 13\% \text{Cr} - 16\% \text{Ni} - 30\% \text{Mo}$. The hot strip quenched to quench temperature can optionally be wound. Subsequently, the hot strip is kept at a temperature of $-80^{\circ}\text{C} < \text{quench temperature} < +80^{\circ}\text{C}$. for a duration between 6 and 2880 min. The hot strip is heated to a partitioning temperature or kept at a partitioning temperature which is at least the quench temperature $\pm 80^{\circ}\text{C}$. of the hot strip and at most 500°C ., for a partitioning time between 30 and 1800 min. In the case that heating to the partitioning temperature takes place, the heating rate is not more than 1 K/s. Subsequently, the hot strip is cooled down to RT.

[0063] The correspondingly produced hot strip made from Q&P steel preferably has a tensile strength (R_m) between 800 and 1500 MPa, a yield point (R_e) above 700 MPa, an elongation at break (A_{50}) between 7% and 25% to DIN EN ISO 6892, and very good deformability, for example hole expansion $>20\%$ to DIN ISO 16630. The hot strip preferably has a microstructure with a martensite content of $>85\%$ area %, preferably $>90\%$ area %, of which $>50\%$ is annealed martensite. The residual austenite content is $<15\%$ area %; the proportions of bainite, polygonal ferrite and cementite are each less than 5 area %, where one or more of the proportions of bainite, polygonal ferrite and cementite are absent. In addition, the hot strip may be pickled and/or coated with an especially inorganic anticorrosion coating and/or an organic coating. Semifinished products are divided from the hot strip produced and provided for production of components for high-wear applications. The Q&P steels are suitable for the production of components, especially having complex geometry, for example for geometries having a bending angle α of at least 60° , especially at least 75° , preferably at least 85° , more preferably at least 90° , especially preferably at least 95° , for example the degree of forming of the half-shell (2), and/or having a bending ratio of $r/t < 2.5$, especially $r/t < 2.0$, preferably $r/t < 1.5$, where t corresponds to the material thickness of the steel and r to the (inner) bending radius of the steel, for example in the region of the embossments (2.1); see FIG. 1. The side components (3), if they do not have to be subjected to complex shaping, may be provided from conventional wear-resistant steels.

[0064] The invention is not limited to the working example shown in the drawing and to the embodiments in the general description. Instead, it is also possible to produce other components for any high-wear applications, especially those having a complex geometry, from a Q&P steel, which have especially been cold-formed, especially components or parts for construction machinery, agricultural machinery, mining machinery, transport machinery or conveying systems.

1. A formed component (2) for high-wear applications, the formed component produced by a Q&P steel wherein the Q&P steel has a hardness of at least 230 HB, and at least one of a bending angle α of at least 60° , determined to VDA238-

100, and a bending ratio of $r/t < 2.5$, where t corresponds to the material thickness of the steel and r to an inner bending radius of the steel.

2. The component (2) of claim 1, wherein the component comprises Fe and unavoidable impurities from a preparation consisting of, in % by weight:

C: 0.1-0.3%,
Si: 0.7-1.8%,
Mn: 1.5-3.0%,
Al: up to 1.5%,
N: up to 0.008%,
P: up to 0.02%,
S: up to 0.003%.

3. The component (2) of claim 2, wherein the component has been one of pickled and coated on at least one side with one of an anticorrosion coating and an organic coating.

4. The component (2) of claim 2 wherein the component has a material thickness (t) between 1.5 and 15 mm.

5. The component (2) of claim 2 wherein the component produced is used in construction machinery, agricultural machinery, mining machinery, transport machinery or conveying systems.

6. The component (2) of claim 2, wherein the component produced is a grab.

7. The formed component of claim 1 wherein the Q&P steel has a hardness of at least 300 HB.

8. The formed component of claim 1 wherein the Q&P steel has a hardness of at least 370 HB.

9. The formed component of claim 1 wherein the bending angle α is at least 75° .

10. The formed component of claim 1 wherein the bending angle α is at least 85° .

11. The formed component of claim 1 wherein the bending ratio is $r/t < 2.0$.

12. The formed component of claim 1 wherein the bending ratio is $r/t < 1.5$.

13. The formed component of claim 2 wherein the component further comprises:

at least one of "Cr, Mo, Ni, Nb, Ti, V, B" with

Cr: up to 0.4%,
Mo: up to 0.25%,
Ni: up to 1.0%
Nb: up to 0.06%,
Ti: up to 0.07%,
V: up to 0.3%,
B: up to 0.002%.

14. The component of claim 4 wherein the material thickness (t) is between 2.5 and 10 mm.

15. The component of claim 4 wherein the material thickness (t) is between 3.5 and 8 mm.

16. The component of claim 2 wherein the component produced is one of a scrap grab or part thereof.

17. The component of claim 2 wherein the component produced is a shovel.

18. The component of claim 2 wherein the component produced is part of a conveying device.

19. The component of claim 2 wherein the component produced is a part for conveying one of abrasive suspensions and solid substances.

* * * * *