Conserving resources with materials for additive manufacturing

Deutsche Edelstahlwerke optimize special steel Bainidur® for 3D printing

Developing flexible materials for the most diverse areas of applications:
Deutsche Edelstahlwerke (DEW), a company of the SCHMOLZ + BICKENBACH Group, has made this its mission - especially since DEW has increasingly focused on solutions for additive manufacturing. The steel experts are doing justice to this with the new Bainidur® AM (= Additive Manufacturing). The established bainitic special steel can be processed without deformation and with minimal machining allowance, saving time-consuming process steps.

At DEW the additive manufacturing topic is omnipresent. In contrast to mechanical manufacturing processes such as milling or turning, the component is built up layer by layer here. In order to meet the increasing demand from its customers in this area, the steel experts from Witten and Krefeld are now producing up to 200 materials using powder metallurgy. Bainidur®, which is familiar among DEW customers, has now also been optimized for additive manufacturing. This makes Bainidur® one of the few types of steel that can be used both - for 3D printing as well as for large-scale production (e.g. automotive parts).

Suitable for 3D printing and saves on CO₂
There are currently only a few low and medium alloyed steels on the market that can be processed by additive manufacturing. Bainidur® AM meets this demand in contrast, as it can be used to print initial samples quickly and efficiently that also have the subsequent component properties. The heat treatment and thermochemical surface treatments can be tested and optimized with the same material as is done in serial production. The spare part –
additively manufactured when the forging dies have long since disappeared – cannot be told apart from the original either. This is supported by its good transformation behavior into the bainitic structure. The material is therefore easy to handle during powder production and printing. For example, high strength components for lightweight automotive construction can be produced with process reliability, without distortion and, as a consequence, with minimal machining allowance and reduced heat treatment time and effort. DEW customers benefit from a shorter process chain and a constantly reproducible high quality. The material properties often allow the component to be used without further heat treatment. The potential of Bainidur® thus goes as far as large-scale production.

Due to the increased component strength, it is possible to reduce the size and thus the weight. A measure that considerably saves on CO₂. Bainidur® AM is therefore the perfect steel to produce higher strength components without additional or only with simple heat treatment. Many parts can be used after printing without any heat treatment at all. Other benefits of the new special steel are its good machinability and nitridability. Furthermore, it scores well with a good notch impact strength. These attributes also have a positive effect on the process costs and the component quality.

You can find more details at [www.dew-powder.com/bainidurAM](http://www.dew-powder.com/bainidurAM).

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**Caption 1:** With the special steel, Bainidur®, Deutsche Edelstahlwerke is not only paving the way towards a cost-efficient production of innovative forged parts, but with Bainidur® AM is providing the material for prototyping and additive manufacturing of spare parts, source: Deutsche Edelstahlwerke
Caption 2: From additive manufacturing to serial production - DEW meets this requirement with the established special steels, Bainidur® 1300 and Bainidur® 7980 CN. The new bainitic steels are not only expanding large-scale production via the electric arc furnace, but with Bainidur® AM are also expanding the portfolio of metal powders, source: Deutsche Edelstahlwerke

About Deutsche Edelstahlwerke
Deutsche Edelstahlwerke is one of the world’s leading manufacturers of special steel long products. Deutsche Edelstahlwerke can look back on over 160 years of experience in the production of high-grade steel products. The range of products is unique worldwide and includes tool steels, stainless, acid and heat-resistant steels, engineering and bearing steels, and special materials. The product portfolio ranges from 4.5 mm drawn wire to forged products of up to 1,100 mm in diameter. Deutsche Edelstahlwerke customers receive the entire manufacturing chain from a single source: from production to prefabrication to heat and surface treatment. Deutsche Edelstahlwerke is a company of the SCHMOLZ + BICKENBACH Group.

About SCHMOLZ + BICKENBACH
The SCHMOLZ + BICKENBACH Group is one of the world’s leading providers of individual solutions in the special long steel products sector. The Group is one of the leading manufacturers of tool steel and non-corrosive long steel on the global market and one of the two largest companies in Europe for alloyed and high-alloyed quality and engineering steels. With more than 10,000 employees and its own production and distribution companies in more than 30 countries on 5 continents, the company guarantees global support and supply for its customers and offers them a complete portfolio of production and sales & services around the world. Customers benefit from the company’s technological expertise, consistently high product quality around the world as well as detailed knowledge of local markets.

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