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Innovation in advanced and sustainable prehardened steels: introducing Toolox 46 for high performance hot work tooling applications

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Prehardened already heat-treated steels are commonly used in tooling applications. Most plastic moulds are for example produced from such steel products. The benefits are several compared to machining soft steel and do external heat treatment. Among those are shorter lead times, lower costs, and a better control of the product quality. Commercial prehardened steels have a limited maximum hardness, and Toolox 44 a product from Swedish special steel producer SSAB has been the market leader with 45 HRC. Also, in some tooling segments like hot work applications there has not been any prehardened steel available with sufficient performance.
SSAB has recently developed Toolox 46, a new steel grade that has been proven in application testing to fulfill this market need. Performing similar or even better than Electroslag Remelted (ESR) hot work steels commonly used. This product is designed as a medium carbon steel (in the lower carbon range) with relatively low alloying content. The alloy and process design for Toolox 46 results in a tempered martensite microstructure with combination of required properties for this type of applications, offering an excellent machinability given its hardness level. This product is produced via continuous casting, rolling and heat treatment to deliver a ready to use product. As a result, no further heat treatments are required at local heat treatment facilities, which also potentially contributes to a lower environmental impact. As already one of the world's most carbon emission-efficient steel producers, together with partners and customers (i.e., within HYBRIT technology), SSAB is taking further significant steps toward reducing carbon emissions and creating a fossil free value chain from mine to end products.
This paper will present and discuss production characteristics, microstructure and properties along with several application cases of Toolox 46, which would explain the success and high performance of this product.

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Are you interested in publishing the paper in a Steel Research International special issue?

Yes

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