3rd EUROFORGE
Milan, Italy / 22–23 Oct 2024
conFAIR 2024
the future of forging

Industry Presentation

Title: **High Cleanliness Special Tool Steels for various Applications**

Authors: ***Stefan Luthardt***

Speaker: **Stefan Luthardt**

Company: **Buderus Edelstahl Gm**

Insert photo here

Stefan Luthardt

2019-today: Head of Product Technology -"Forged Products"
2018-2019: Head of Product Technology - "Components"
2014-2018: Engineer in Product Technology Engineering Steels
2008-2014: Engineer in Product Technology Shaped Forgings
2005-2008: Bachelor of Business Administration + Engineering

Abstract:

Besides Steel and Aluminium workpieces, Titanium- and Nickel alloy forgings have become very common when talking about challenges in closed-die forging processes in recent years.
In addition, the process temperatures and die sizes for closed-die forgings have become more diverse. An increase of near-net shape forgings with small radii, delicate features and other stress concentration factors also lead to more mechanical stresses imposed on the forging tools. These diversities require tool steels for closed-die forgings to have more adaptability.
To achieve a long service life, tool steel for different applications should be chosen individually.
In this paper, two special tool steels for die forging industry will be introduced:
HWS-Supreme is a newly developed special hot work tool steel. It provides extra wear resistance and hardness in closed-die forging tools. It is especially suitable for medium-sized dies with complex cavity designs and long service life requirements. It has been successfully used in crankshaft dies where abrasive wear was too high with standard grade 1.2344 and gross-cracking became an issue when using 6.5%-CrMoV hot-work tool steels.
9966 SUPER-C is a patented special tool steel with a high Nickel content.
It differs from other tool steels by its extremely high toughness in combination with a very high strength level. This combination is crucial in highly stressed forging dies where both, fatigue cracking and gross cracking are critical. Consequently, it is used on a large-scale to forge Nickel-, Titanium- and Aluminum-based workpieces for aerospace applications. In addition to its

Besides Steel and Aluminium workpieces, Titanium- and Nickel alloy forgings have become very common when talking about challenges in closed-die forging processes in recent years.
In addition, the process temperatures and die sizes for closed-die forgings have become more diverse. An increase of near-net shape forgings with small radii, delicate features and other stress concentration factors also lead to more mechanical stresses imposed on the forging tools. These diversities require tool steels for closed-die forgings to have more adaptability.
To achieve a long service life, tool steel for different applications should be chosen individually.
In this paper, two special tool steels for die forging industry will be introduced:
HWS-Supreme is a newly developed special hot work tool steel. It provides extra wear resistance and hardness in closed-die forging tools. It is especially suitable for medium-sized dies with complex cavity designs and long service life requirements. It has been successfully used in crankshaft dies where abrasive wear was too high with standard grade 1.2344 and gross-cracking became an issue when using 6.5%-CrMoV hot-work tool steels.
9966 SUPER-C is a patented special tool steel with a high Nickel content.
It differs from other tool steels by its extremely high toughness in combination with a very high strength level. This combination is crucial in highly stressed forging dies where both, fatigue cracking and gross cracking are critical. Consequently, it is used on a large-scale to forge Nickel-, Titanium- and Aluminum-based workpieces for aerospace applications. In addition to its extraordinary toughness, 9966 SUPER-C also has supreme through-hardening capabilities even in extremely large dimensions. It is typically sold in pre-hardened supply condition and requires no further vacuum heat treatment in near-net shape condition, which increases flexibility in application, reduces total cost, saves time-to-market and reduces the CO2 emission footprint.
Thanks to its low carbon content and the reduced susceptibility to detrimental segregation effect 9966 SUPER-C can be produced in huge dimensions from ingots weighing up to 190 t. Typical a