

Sandvik launches new hot-work tool steel with enhanced printability: Osprey® HWTS 50

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Sandvik introduces Osprey® HWTS 50, a lean hot-work tool steel powder designed for enhanced printability. Primarily developed for laser-based Additive Manufacturing (AM), it is also well-suited for Hot Isostatic Pressing (HIP) and Metal Injection Molding (MIM). Tempering and thermal fatigue resistance as well as thermal conductivity are improved compared with conventional H-class hot work tool steels. These advanced properties effectively address many common challenges in hot-work applications within general engineering.

Osprey® HWTS 50 improves the processability in Laser Powder Bed Fusion (L-PBF), lowering the susceptibility of cold cracking compared with conventional H-class hot work tool steels. Typical applications include high-pressure die casting dies, injection molds, and hot forming tools.

The chemical composition is tailored for improved hot hardness at temperatures exceeding 600°C (1 112°F). It is characterized by lower carbon content compared with those of medium carbon hot work tool steels and modifications to the carbide forming elements. This is to ensure a comparable or even enhanced tempering resistance despite lower carbon wt.%.

The thermal conductivity of Osprey® HWTS 50 is higher compared to medium carbon tool steels over a wide temperature range. High thermal conductivity is beneficial for applications running at elevated temperatures, such as die casting and forging. It ensures rapid and efficient heat dissipation, resulting in faster cycles.

Faraz Deirmina, Principal Metallurgist in metal powder at Sandvik, says:

“Additive manufacturing is increasingly being used to produce tools and dies with near-surface conformal cooling channels. Besides optimizing processing parameters, it is important to develop chemistries specifically tailored for this technology to address fabrication challenges. Osprey® HWTS 50 is designed to alleviate these challenges making it highly suitable for tooling applications at elevated temperatures. Examples are hot forming dies, extrusion and injection molding dies, and high pressure die casting dies.”

Osprey® HWTS 50 metal powder is manufactured by either induction melting under Vacuum Inert Gas Atomization (VIGA) or melting under argon prior to Inert Gas Atomization (IGA), producing a powder with a spherical morphology which provides good flow characteristics and high packing density. In addition, the powder has a low oxygen content and low impurity levels, resulting in a metallurgically clean product with enhanced mechanical performance.

With the alloy design philosophy behind HWTS 50, Sandvik is contributing to a more sustainable future in several ways. By using leaner compositions optimized through computational tools, we increase resource efficiency and extend the lifetime of components, which in turn reduces energy consumption and CO2 emissions. Additionally, computational tools enable faster and more eco-friendly alloy development with optimized chemistries, outperforming traditional trial-and-error methods.



Sandvik has a patent pending for Osprey® HWTS 50 covering the composition of the alloy.

Key characteristics of Osprey® HWTS 50:

- **Processability:** Improved processability in L-PBF, reducing cold cracking compared to conventional hot-work tool steels.
- **Chemical composition:** Optimized for improved hot hardness, tempering, and thermal fatigue resistance. It features lower carbon content and modified carbide-forming elements to ensure comparable or improved tempering resistance.
- **Thermal conductivity:** Approximately 35 W/mK at room temperature, providing excellent performance in high-temperature applications such as die casting and forging.
- **Hardness:** Depending on tempering temperature, a hardness range of 40 to 50 HRC in combination with excellent tensile and impact properties can be achieved, ensuring the longevity and durability of molds and dies under high-stress conditions.

Key application areas for Osprey® HWTS 50:

- **Mold making:** Injection molds.
- **Extrusion dies:** Mandrels and cores.
- **Hot forging:** Dies and components.
- **Die casting tooling:** Hot gripper dies and related components.
- **Plastic molding:** Molds and dies.
- **Tool holders:** Various tooling applications.
- **Mold repair:** Rebuilding die casting molds via Direct Energy Deposition (DED).

Read more about Osprey® HWTS 50 metal powder:

<https://www.metalpowder.sandvik/en/products/metal-powder-alloys/tool-and-high-speed-steel/osprey-hwts-50/>

For further information, contact VP Marketing and Communication, Powder Solutions, Sandvik, email: greta.ninova@sandvik.com



Sandvik Group

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Captions HWTS 50 Photo press kit

File name: Osprey® HWTS 50 studio photo

Caption: Osprey® HWTS 50 is Sandvik's new hot-work tool steel powder

File name: 3D printed mold with Osprey® HWTS 50

Caption: Mold insert for plastic injection molding, 3D printed with Osprey® HWTS 50 metal powder

File name: Osprey® HWTS 50 in 3D printing workshop

Caption: Osprey® HWTS 50 is Sandvik's new lean hot-work tool steel powder

File name: 3D printed components with Osprey® HWTS 50

Caption: 3D printed mold and tool holder with Osprey® HWTS 50 metal powder

File name: 3D printed mold with Osprey® HWTS 50

Caption: Cooling channels near surface on 3D printed mold with Osprey® HWTS 50 metal powder

File name: Faraz Deirmina, Sandvik with Osprey® HWTS 50

Caption: Faraz Deirmina, Principal Metallurgist in metal powders Sandvik, demonstrating Osprey® HWTS 50 metal powder

Link to press kit

https://drive.google.com/drive/folders/13nNhnYPaPfcT9bM9ETmQ7-xb9w-0Uuh3?usp=drive_link