

# Metallurgical Double Girder Overhead Crane For Molten Metal Lifting In Foundry

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Metallurgical Double Girder Overhead Crane

The metallurgical double girder overhead crane is a specialized lifting equipment tailored for the harsh working environment of foundries, especially designed for the safe and efficient lifting of molten metal. With its robust structure, advanced safety protection systems and reliable performance, it has become an indispensable core equipment in the metallurgical casting process, ensuring the smooth progress of production operations while maximizing operational safety.

## Product Features of Metallurgical Double Girder Overhead Crane & Heavy-Duty Molten Metal Handling Crane



Metallurgical Double Girder Overhead Crane

**High-Temperature Resistance:** The key components of the metallurgical double girder overhead crane, such as the lifting mechanism, trolley frame and [crane hook](#) group, are made of high-temperature resistant materials. After special heat treatment, they can withstand the high-temperature radiation of molten metal (up to 1600°C) for a long time, avoiding performance degradation or structural damage caused by high temperatures—a critical advantage for any foundry-specific metallurgical crane.

**Robust Structural Design:** Adopting a double girder structure, the crane has high structural rigidity and bearing capacity. The main beam is usually designed with a box-type section, which effectively improves the bending and torsion resistance, ensuring stable operation even when lifting heavy molten metal ladles. The overall structure is optimized through finite element analysis to reduce weight while ensuring strength.

**Multi-Layer Safety Protection:** Equipped with a comprehensive safety protection system, the metallurgical double girder overhead crane includes overload protection, overheat protection, anti-collision protection, power failure protection and emergency braking devices. The overload limiter can immediately cut off the lifting power when the load exceeds the rated value; the anti-collision device uses infrared sensors to avoid collisions between the crane and the workshop wall or other equipment; the emergency braking system can quickly stop all movements in case of emergency to prevent molten metal spillage, ensuring safe operation of the molten metal lifting metallurgical crane.

**Precise Control Performance:** Adopting variable frequency speed regulation technology, the lifting and running speed can be adjusted steplessly, realizing smooth starting, stopping and



speed change. This not only improves the stability of molten metal lifting, avoids splashing caused by sudden speed changes, but also reduces the impact on the crane structure and extends the service life of the equipment.

Easy Maintenance and Operation: The [double girder overhead crane](#) is equipped with a user-friendly operation platform and control system, which can be operated by a driver's cab or remote control. The cab is designed with a good view, allowing the driver to clearly observe the lifting process. At the same time, key components are designed with easy access, facilitating daily inspection, maintenance and repair, reducing downtime.

## Technical Parameters of Foundry Molten Metal Metallurgical Double Girder Overhead Crane

Parameter Item	Specification
Rated Lifting Capacity	10-500 t
Span	10-35 m
Lifting Height	8-30 m
Lifting Speed	0.5-10 m/min (stepless speed regulation)
Trolley Travel Speed	5-30 m/min
Crane Travel Speed	10-45 m/min
Working Class	A7-A8 (heavy-duty working system)
Power Supply	380V/50Hz, three-phase AC
Temperature Resistance	≤1600°C (ambient temperature around molten metal)
Overall Weight	Depends on lifting capacity and span (15-500 t)

## Working Principle of High-Temperature Metallurgical Double Girder Overhead Crane

The metallurgical double girder overhead crane is composed of main components such as the main beam, end beam, [overhead crane trolley](#), lifting mechanism, traveling mechanism and electrical control system. Its working principle, tailored for the foundry molten metal handling scenario, is based on the coordinated operation of each mechanism to realize the lifting and transportation of molten metal by the high-temperature metallurgical overhead crane.

1. **Lifting Mechanism:** Driven by a high-temperature resistant motor, the lifting mechanism transmits power to the reducer through a coupling. The reducer reduces the speed and increases the torque, and then drives the drum to rotate through the transmission shaft. The steel wire rope wound on the drum drives the hook group to rise or fall, thereby realizing the lifting and lowering of the molten metal ladle. The variable frequency speed regulation system controls the motor speed to achieve stepless adjustment of the lifting speed.
2. **Trolley Travel Mechanism:** The trolley is installed on the track of the main beam. Under the drive of the trolley motor, the power is transmitted to the trolley wheels through the transmission mechanism, making the trolley move along the main beam. This realizes the horizontal movement of the molten metal ladle in the direction of the span.
3. **Crane Travel Mechanism:** The end beam is equipped with crane wheels, which are driven by the crane motor. The power is transmitted to the wheels through the transmission system, making the entire crane move along the track laid on the workshop roof. This realizes the horizontal movement of the molten metal ladle in the direction of the workshop length.
4. **Safety Control:** The electrical control system is the core of the metallurgical double girder overhead crane's operation control and safety protection. It collects signals from various sensors (such as overload sensors, temperature sensors, anti-collision sensors) in real time. When an abnormal situation is detected (such as overload, overheating, approaching obstacles), the system will immediately issue a command to cut off the corresponding mechanism's power supply and start the emergency braking device, a vital safety measure for the molten metal handling metallurgical crane.

## **Applications of Metallurgical Double Girder Overhead Crane in Foundry Molten Metal Scenarios**

The metallurgical double girder overhead crane is widely used in various links of the foundry production process, especially in the lifting and transportation of molten metal, which plays a key role in ensuring the continuity and safety of production. Its main applications include:

**Molten Metal Tapping:** After the metal is melted in the furnace (such as electric arc furnace, induction furnace), the metallurgical double girder overhead crane lifts the molten metal ladle to the furnace mouth, receives the molten metal poured out of the furnace, and then transports the ladle to the next process. The high-temperature resistance and stable lifting performance of the foundry-specific double girder crane ensure that the molten metal is not spilled during the tapping process.

**Molten Metal Pouring:** The crane transports the molten metal ladle filled with molten metal to the casting mold area, and accurately controls the lifting and tilting of the ladle through the precise control system to pour the molten metal into the casting mold evenly and stably. This is crucial to ensure the quality of castings, avoiding defects such as cold shut and porosity caused by uneven pouring.

**Lifting of Casting Molds and Products:** In addition to lifting molten metal, the crane can also be used to lift and transport casting molds (such as sand molds, metal molds) and finished castings. The robust structure and large lifting capacity of the double girder crane can meet the lifting needs of heavy molds and castings, improving the efficiency of mold handling and product loading and unloading.

**Auxiliary Operations in Foundry:** It is used for auxiliary operations such as lifting and installing furnace equipment, maintaining workshop equipment, and transporting raw materials (such as scrap metal, alloy materials) in the foundry. The flexible movement and wide operating range of the crane make it an important auxiliary equipment to ensure the normal operation of the foundry.

## **Conclusion on Metallurgical Double Girder Overhead Crane for Foundry Molten Metal Lifting**

The metallurgical double girder overhead crane for molten metal lifting in foundry is a high-performance, high-safety specialized lifting equipment that integrates high-temperature resistance, robustness, precision control and comprehensive safety protection. As a core foundry molten metal handling crane, it effectively solves the problems of difficult lifting and high safety risks of molten metal in the foundry production process, and provides a reliable guarantee for improving production efficiency, ensuring product quality and protecting the safety of personnel and equipment. With the continuous development of the metallurgical casting industry, the heavy-duty metallurgical double girder overhead crane will be further optimized and upgraded in terms of intelligence, energy conservation and environmental protection to better meet the needs of modern foundry production.

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