
Handling of hot-rolled coils

Robust and reliable in use

Every day steel mills and logistics warehouses handle huge volumes of hot-rolled coils either internally as semi-finished products or externally as products for sale. TRUNINGER coil magnets enable quick, safe and reliable handling of such coils, as well as highly efficient loading and unloading of lorries, railway wagons and ships.



Figure 1: Coil magnet loads and unloads ships and railway wagons

In contrast to cold-rolled coils, hot-rolled coils are not tightly wound due to contraction of the individual layers during the cooling process. The air gaps that form between the layers of steel significantly reduce the magnet's lifting force (see figure 3); the larger the air gap the greater the impact on the lifting force. For safety reasons this loss of lifting force needs to be compensated somehow.

Coil magnets with a deeply-penetrating magnetic field been specially developed for hot-rolled coils.

At TRUNINGER the dimensioning and design of such magnets is determined using the FE method. Finite element simulation helps us to optimise existing magnet designs and to develop new, client-specific magnet solutions.

Using the FE method, lifting force, magnetic field penetration and air gap tolerance can also be simulated in advance on the computer. This guarantees a smooth transfer of customer specifications from theory into practice (see figure 2).

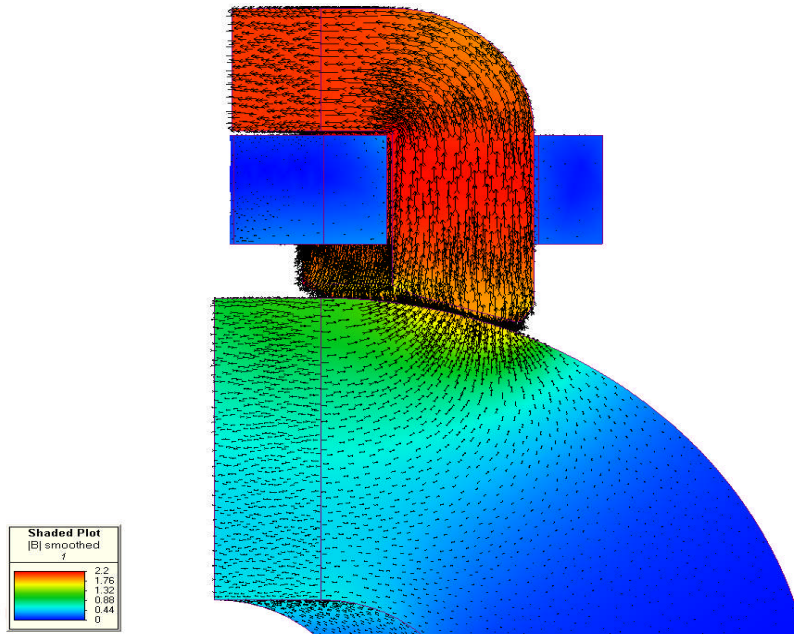


Figure 2: FE calculation of depth of magnetic penetration into a coil

Advantages

- Fast picking and setting down of coils as well as easy handling
- Small overall height of magnet allows full stack height utilisation
- No coil edge damage during transport
- Hot-rolled coils securely held despite air gaps
- Fast and thorough demagnetisation

Your benefits

- Significant time saving when handling coils magnetically
- You can store considerably more material within the same area
- No loss of coil quality
- No problem handling coils with air gaps
- Complete removal of residual magnetism
- Excellent integration into automated warehouse systems

Features of TRUNINGER design

- Coil magnets can be equipped with two independent magnet coils with each coil being powered and monitored separately from the magnet controller. If one coil fails, the surviving coil will continue to carry the load. The controller generates a visual and audible alarm and optionally sends a signal to the crane. When this happens the load must be set down and the magnet switched off (see 'Fully redundant system' document).



Figure 3: Moving a hot-rolled coil into store – Note the air gap

- Using signals from proximity sensors mounted between the magnet poles the crane control system is able to reduce the approach speed of the hoist. It is thus possible to guarantee that the magnet is set down gently on the coil's surface.



Figure 4: Carrying hot-rolled coils in an open-air storage area

- Specially developed magnets with temperature-resistant magnet coils guarantee a long service life for the magnets when used to carry hot coils in harsh environments.