

UNIGUARD® MOLD COATING

Superior Protection, Hardness and Heat Resistance in One Coating

Until now, choosing a coating configuration for continuous casting mold coppers was a compromise. While an extremely hard coating on mold coppers significantly reduces wear, conventional hard coating materials can't withstand the heat.

For most steel producers, this meant deciding between a step-nickel configuration that left the copper on the upper half of the mold exposed or using a full-face tapered-nickel configuration in which the nickel thickness increases towards the bottom of the coppers. However, nickel-based coatings with a 250+ Vickers are not suitable for the meniscus area because they tend to crack and eventually spall from thermal cycling.

Now there's no need to compromise. With the UniGuard® Coating process, a field-proven proprietary technology available exclusively from SMS group, an SMS group company, steel producers can protect molds with a single extremely hard, heat-resistant coating solution.

A breakthrough in mold coating technology

The revolutionary UniGuard® Mold Coatings for broad-, narrow-, beam-blank and bloom-style coppers are a mold coating breakthrough because they combine a hardness of 1100+

Vickers, which rivals hard chrome, and the ability to withstand the meniscus temperatures of most continuous casting molds. As a result, the life of molds coated with UniGuard® Mold Coatings is substantially increased, well beyond what was previously attainable.

In addition, some steel producers use the thermal properties of UniGuard® Coatings to alter hot-face temperatures of near-scrap coppers and, consequently, produce products with more consistent quality.

WEAR PROTECTION OF MENISCUS



Meniscus with UniGuard® Coating after 342,000 tons

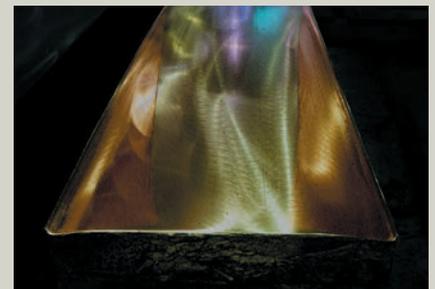


Nickel-coated meniscus after 120,000 tons

WEAR PROTECTION ON BOTTOM THIRD OF COPPER



Copper with UniGuard® Coating after 342,000 tons



Nickel-coated copper after 120,000 tons

Shown above is a comparison of two narrow-face coppers exposed to very similar casting conditions because they were both run simultaneously at the same caster in separate strands. One copper had a UniGuard® Coating, the other had a full-face tapered nickel

coating. The tonnage reported is full tons cast on a specific strand. After casting nearly three times the amount of steel, the wear on the coppers with the UniGuard® Coating was less than 0.010" (0.25mm); the wear on the tapered-nickel coppers was greater than 0.120" (3mm).

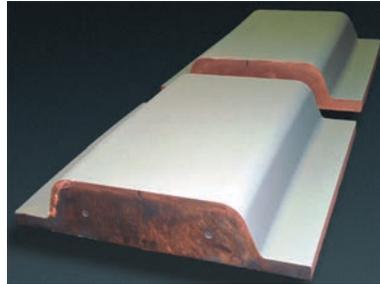
Mold wear and life-cycle costs are reduced, record campaigns

In the past, some casters were forced to schedule production and maintenance around mold wear. With a hardness of 1100+ Vickers, UniGuard® Mold Coatings can virtually eliminate narrow-face wear and, in many cases, nickel-coated broad-faces become the limiting factor for determining when a mold must be removed from service.

Because UniGuard® Coatings reduce taper loss, decrease corner gaps, improve corner support, provide unsurpassed meniscus protection plus more even and consistent heat extraction, campaign life and production capabilities can be significantly increased.

Several customers have set mold service campaign records for their respective casting machines using UniGuard® Moat Coatings. In the case of conventional thick slab casters, several North American casters achieve 500,000+ tons per campaign on a routine basis.

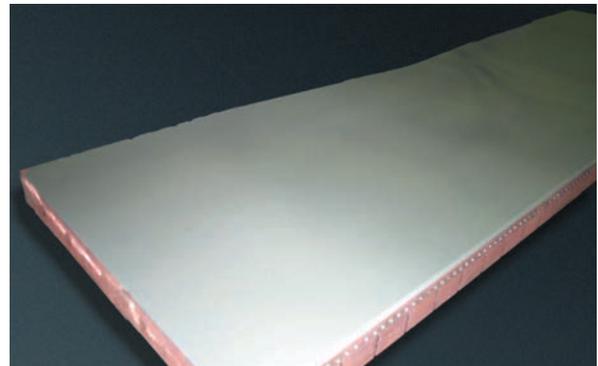
Even though campaigns are longer, less copper is removed from molds coated with UniGuard® Coatings during refurbishment than with standard coatings. The result is reduced life-cycle costs for mold coppers.



▲ Beam-blank copper with UniGuard® Coating



▲ Conventional broad-face copper with UniGuard® Coating



▲ Narrow-face copper with UniGuard® Coating (left) and large medium-slab broad-face copper with UniGuard® Coating (right)

Coatings matched to surface requirements

The precise chemistry of the UniGuard® Mold Coatings are tailored to the specific needs of each mold serviced.

Any type of mold copper suitable for casting can be coated with a UniGuard® Coating, and coating configurations are customized for each mold. Because molds that are

refurbished with UniGuard® Coatings are processed in one facility, we can provide responsive turn-arounds.

To find out more about how UniGuard® Mold Technology can help extend your production campaigns, give your company a competitive advantage and improve its bottom line, call our Coatings Department at 814-677-9400.

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