The Trend Toward Black

This versatile zinc-nickel coating provides a range of durable finishes

A new decorative black nickel plating technology is quickly finding favour in the auto industry and elsewhere.

The process, known as Nickstar, deposits a thin and highly uniform over-coat of black zinc-nickel alloy, preserving the substrate's brightness while producing a rich, totally black nickel finish. That makes it ideal for the decorative trim of car interiors, in particular molding and handles, that require non-reflective properties.

In addition to diminishing glare, Nickstar improves durability. For both these reasons, it's also used in the manufacture of certain upscale sporting goods such as golf clubs and goalie masks for hockey.

"There's a growing demand for black nickel finish," says Don Walsh, director of operations for the company which developed the technology, Uyemura U.S.A., which is based in Ontario, California. "For many years, the tradition was bright nickel; in the past 10 years, the trend has been for different blends and shades of satin nickel; and now, black finish is the way to go."

The lustrous, highly versatile Nickstar alloy contains 50-60% zinc and 40-50% nickel within the deposit. The coating is applied by electrolytic plating onto bright nickel, brass or copper surfaces.

"The nickel is a key component of the deposit's black appearance and provides hardness, adhesion and corrosion resistance," says Walsh.

A deposit thickness of up to 2 microns can be applied in rack or barrel plating equipment. If a thicker deposit, or a high corrosion performance, is required, a heavier nickel undercoat can be used.

Greater hardness can be achieved with an optional salt additive. As well, colour density can be modified from darkest black to softer hues.

Nickstar can be operated at higher current density to speed the plating process – specifically 5-8 amps per square foot versus 1-3 for conventional black nickel.

Moreover, it achieves a deep black deposit in 5-10 minutes, compared with the 15-20 minutes required for traditional black nickel processes.

"In a nutshell, you can put it on faster and smoother," says Walsh.

Nickstar produces a uniform black deposit by means of "easy-to-run chemistry that nonetheless ensures durability," says Mario Orduz, National Product Manager for Uyemura U.S.A. He adds: "It's the black finish – brilliant yet non-reflective – that's so desirable."

The process utilizes both the nickel and the zinc in combination to provide a high degree of corrosion resistance. In industry standard tests, the corrosion resistance of black nickel coating easily outperforms that of conventional coatings.

Uyemura also offers an option to Nickstar, known as Nicostar, which is even more resistant to corrosion, thanks to a co-deposit of cobalt.

"Nicostar is a little harder and therefore more resistant to wear" says Orduz. "But it's slightly lighter in colour than Nickstar. So some customers prefer one, some the other."

Besides decorative trim for the inside of cars, Nickstar is used in the military, where corrosion resistance and non-reflective requirements are essential. Other applications include architecture and construction (for example, door and cabinet handles, locks, and assorted other fixtures) and police and security badges.

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UYEMURA U.S.A.

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