F.lli VEDANI srl
FOUNDRY PRODUCTS

Die Casting Mold CLIN NIVE™ Treatment Service

What is CLIN NIVE Surface Treatment?

The Controlled Liquid Ionic Nitriding CLIN NIVE is a thermo-chemical process, where nitrogen (in ionic form) spreads for diffusion inside the treated parts. The principle is a thermo-chemical reaction combined with the particular salt-bath chemical composition. The benefit of the liquid ionic nitriding is the uniformity and the quickness of nitriding. The metallurgical structure, which is obtained, for example at hot-working steels Material 1.2365 (H10), Material 1.2343 (H11) and Material 1.2344 (H13) is composed from a nitrogen diffusion area, where the same is finely distributed, without the formation of precipitate nitrides and white sheet (hard and brittle to remove with grinding), but with a compound coating very dense and tough. The exterior magnetite layer permits high performance when the molds are utilized for die-casting pressure in the aluminum alloys.

Main benefits and advantages:

Advantage: The piece is entirely immersed in the liquid salt-bath, obtaining a homogeneous surface treatment. The low temperature does not change the steel structure, and neither modifies the matrix s geometry.

HIGH SUPERFICIAL HARDNESS HV 1250/1400

Advantage: The piece is strengthened to the thermal shocks, thus delaying cracks formation owing to thermal fatigue. Additionally, it increases the flowability of the metal and, as a direct effect, improves the filling in the problematic points, avoiding the problem of metallization.

SURFACE OXIDATION

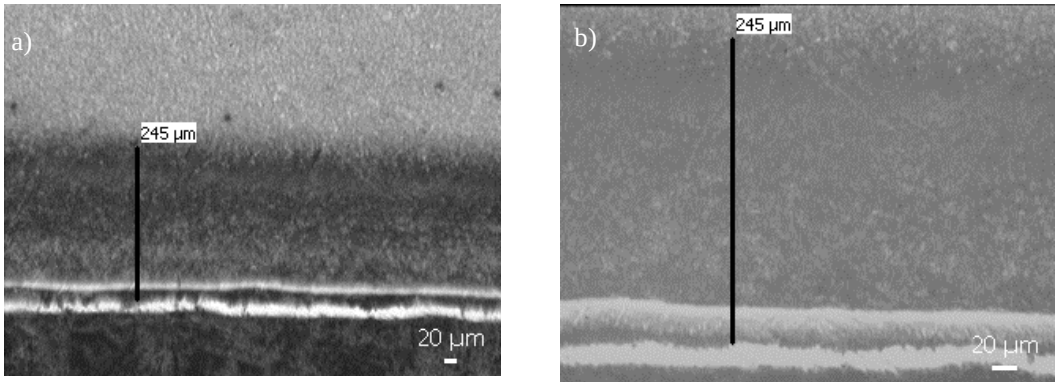
Advantage: The CLIN NIVE contributes to inhibiting the aggressions from chemical substances, such as the release agent and its dilution water. Those elements can sometimes be particularly aggressive, due to the presence of iron-bacteria and to the excessive softness of the water.

FURTHER BENEFITS: The CLIN NIVE treatment can also be implemented on matrixes that have already been used on welled matrixes or on those which have undergone some maintenance operations it can be repeated more times on the same piece.

CLIN NIVE Characteristics and Micrograph images

Table 1: CLIN NIVE and Double CLIN NIVE Characteristics

Treatment	Effective Depth	Diffusion	Compounds Layer
CLIN NIVE	0.25 mm	270 µm	30 µm
Double CLIN NIVE	0.40 mm	400 µm	35 µm



a) Low magnification 10X

b) Higher magnification 20X

Figure 1: Hot work tool steel (Salt-bath Quenching-Tempering) CLIN NIVE micrographs a) 10 X b) 20 X

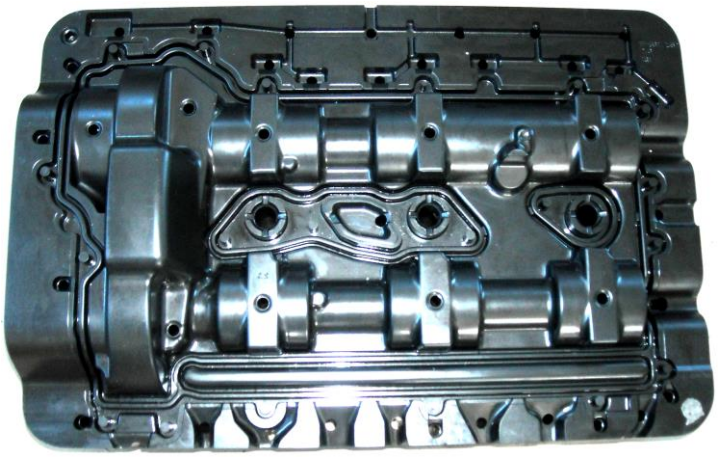


Figure 1: CLIN NIVE Die Casting Mold Example

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