PLASMA NITRIDING OF DIE CASTING MOLDS

To achieve improved durability, plastic molds from cold working steel X36CrMo17 should be nitried after vacuum hardening. Postulated is a thin white layer of 10µ + 5µ, as well as, a surface hardness of at least 150 HV 1. Furthermore, it is very important to maintain the corrosion resistance; in particular in the not nitried bore holes. To prevent the formation of chromium precipitations associated with the loss of corrosion resistance, the tool must be nitried at a temperature between 400°C and 420°C.

For various reasons only plasma nitriding is considered as a suitable option. Especially, considering the following factors:

Because the maximum treatment temperature of ≤ 420°C there is an urgent necessity to nitride the part in plasma. Both of the other common nitriding techniques drop out in consequence of significant higher treatment temperatures. As a very low temperature is used in the process, the chromium ratio of the material remains clearly over twelve percent to preserve entirely corrosion resistance.

Further advantages of the plasma treatment are given in the possibility of exact adjustment of layer morphology, the possibility to mask, for example threaded holes in a very fast and easy way, the hundred percent reproducibility of the process and the employee-protecting and environmental friendly type of treatment. Postprocessing as cleaning, blasting or polishing after plasma nitriding is not necessary anymore.