

INFLUENCE OF RENITRIDING FOR THERMAL FATIGUE PROPERTIES ON NITRIDED HOT WORK DIE STEEL (H13)

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To extend die-casting die life, nitriding is often applied to the die surface. Even the nitriding applied, nitride layer is damaged by heat during the die-casting operation. Thus, if renitriding will be available with sensing damaged layer quantitatively, soundness of die surface will be kept continuously. Then more extension of die life will be expected.

We noticed compressive residual stress on the die surface by nitriding, decomposition of nitride layer on hot work die steel (H13) in thermal fatigue process was tried to sense by X-ray stress measurement. And repair effect of nitride layer by renitriding with shot peening was investigated.

As a result, though compressive residual stress decreased gradually during thermal fatigue test, it was almost restored before the test by renitriding. In the crack measurement during and after the test, number of cracks was decreased as test times increase by surface removal effect of shot peening at renitriding. Compared the renitrided specimen with not renitrided specimen that was nitrided once, number of cracks of was decreased.