

Precision Grinding of Titanium Alloy (Ti-6Al-4V)

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Abstract

In order to reach the demand of higher performance of titanium alloy, aerospace and automotive industries are trying to attain mirror surface finish of products. The loading and glazing were known to be the major factors leading to higher grinding forces, redeposition on the ground surface and break-off of the grit when grinding titanium alloy. The ground surface is easily degraded by these problems. Therefore, it is useful to select a stiff machine tool and a process of self-dressing the wheel during grinding in order to avoid the loading problems. The use of Electrolytic In-Process Dressing (ELID) should reduce the loading situation of the wheel, maintain the sharpness properties of grits and it is believed that this technique will reduce grinding force, improve surface finish and redeposition of material on the ground surface. In order to provide basic insights into ELID grinding, the influence of grinding conditions on surface finish and wheel loading conditions is presented. Though mirror surface finish was not achieved at the grit size selected, the use of ELID improved the surface morphology compared with the use of conventional conditions. It is believed that an optimized condition would generate a high quality surface and precise products. Another

important indication of grinding damage is the grinding burn on the surface. An estimation of the onset of grinding burn is also discussed.

Keyword : Ti-6Al-4V 、 ELID