

New Coated Carbide Grade AC5015S and AC5025S for Exotic Alloys Tuning

1. Overview

Exotic alloys such as Ni-based alloys, cobalt (Co)-based alloys, and titanium (Ti) alloys are often used for equipment and parts used in the aircraft and auto industries due to their superior heat resistance and corrosion resistance. There has been growing demand for tools for machining these alloys.

When cutting exotic alloys, the work material is likely to adhere onto the cutting edge of a tool, resulting in a sudden fracture of the cutting edge of the tool.

The tool life is significantly shorter than that of tools for cutting general steel. Thus, demand for cutting tools with stable performance and long tool life has been increasing.

The newly developed AC5015S and AC5025S are characterized by improved wear resistance and fracture resistance by applying a newly developed physical vapor deposition (PVD) coating and special cemented carbide. These materials help reduce the tool replacement frequency and tool consumption by extending the tool life, contributing to the reduction of machining costs.

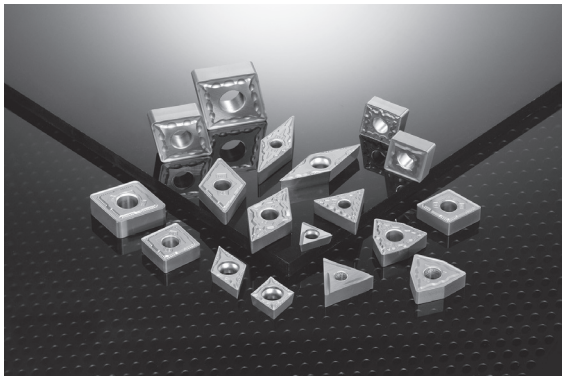


Photo 1. AC5000S series

2. Features

(1) Newly developed coating with superior wear resistance

Cutting tools used for the turning of exotic alloys need to meet the requirements of oxidative wear resistance and diffusional wear resistance. Absotech, which is our proprietary PVD coating technology, and a newly developed AlTiSiN-based film have improved oxidization resistance and reaction resistance, double the wear resistance compared to conventional products.

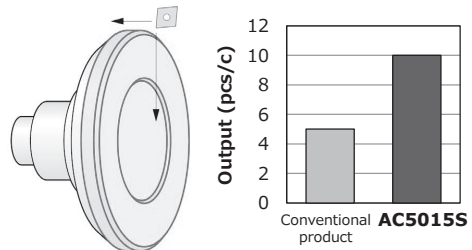
(2) Newly developed cemented carbide with superior toughness

Cutting tools for the turning of exotic alloys need to meet the requirement of notch wear resistance and fracture resistance.

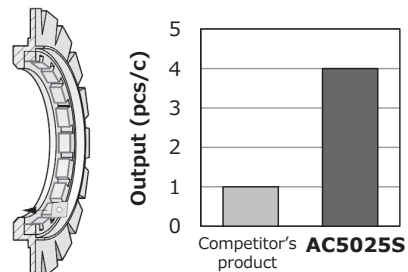
The use of newly developed raw materials and new sintering process have significantly improved toughness while maintaining hardness, achieving a fracture resistance 1.5-fold that of conventional products.

3. Machining examples

Work material: Automotive part (Inconel713C)
 Insert: CNMG120408N-EX
 Cutting conditions: $V_c = 100$ m/min,
 $f = 0.12$ mm/rev, $a_p = 0.3$ mm, wet



Work material: Aircraft part (Hastelloy)
 Insert: CNMG120412N-MU
 Cutting conditions: $V_c = 100$ m/min,
 $f = 0.3$ mm/rev, $a_p = 0.3$ mm, wet



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