

# Tungaloy Technical Articles **Tung**TECH

GrooveLine  
**DUOJUST CUT**  
TUNGALOY

## Improves Productivity in Parting off Small Parts

by Hironori Kondo (Miniature Product Manager)



**TUNG FORCE**  
TUNGALOY ACCELERATED MACHINING

**S**mall, miniature parts are gaining popularity across numerous industries, such as timepiece, mobile phone, automotive, and aerospace manufacturers. These parts are designed and manufactured smaller, thinner and require more precise machining processes. Traditionally these small parts were made of relatively free cutting materials such as brass but the trend today is to produce these parts in High-alloyed, high-strength, non-corrosive materials including titanium alloys, stainless steels, and carbon steels, increasing cutting difficulty and deteriorating tool life. The unique requirements of machining small parts combined with the difficulties inherent with the new material make it difficult if not impossible for traditional part-off tools to perform

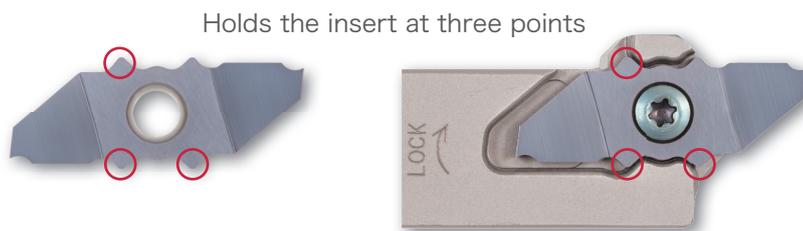
This article introduces Tungaloy's new part-off tool as an answer to these new demands:

**"DuoJust-Cut, which will vastly improve performance and stability in small part machining in Swiss-type automatic lathes."**



## TUNGALOY'S INNOVATIVE INSERT CLAMP SYSTEM

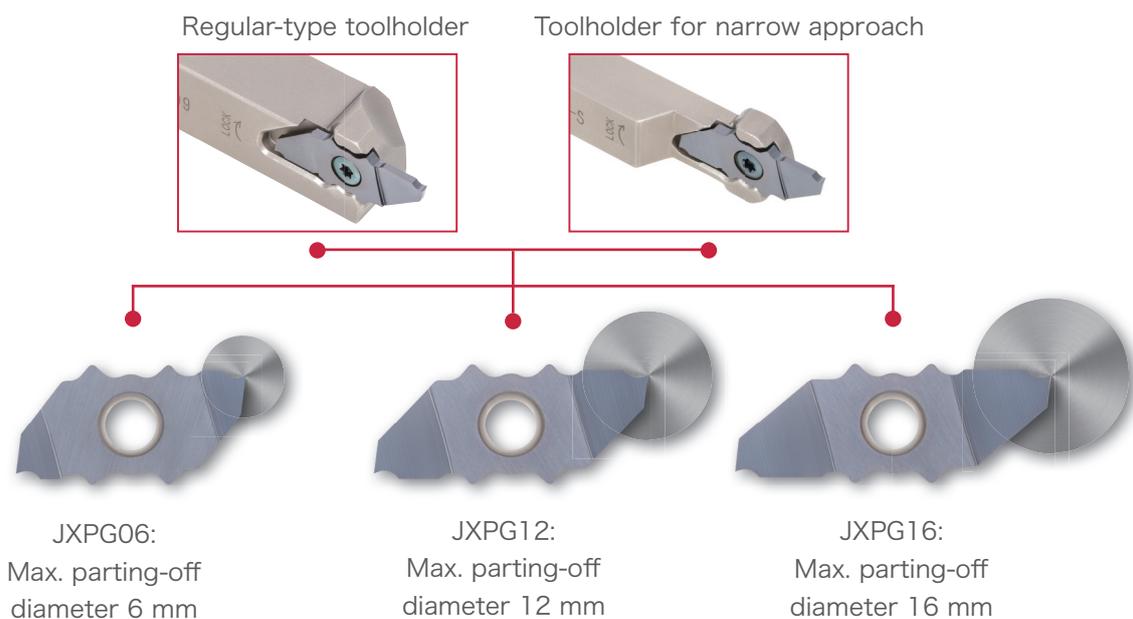
Unpredictable tool life is the enemy of small part machining, often causing catastrophic tool failure. Failure in part off operations is generally caused by small chipping on the cutting edge. These micro-chips generate a built up edge on the cutting surface, reducing surface finish and often causes premature tool failure. Rigidity of the insert is often the cause of the micro chipping. DuoJust-Cut's innovative rigid clamping secures the insert at three critical positions, assuring rigidity and index repeatability, thereby reducing micro chipping and dramatically improving machining stability.



"Since the insert is supported at the center, strong clamping is maintained on the insert even if one of the two corners is broken off during use."

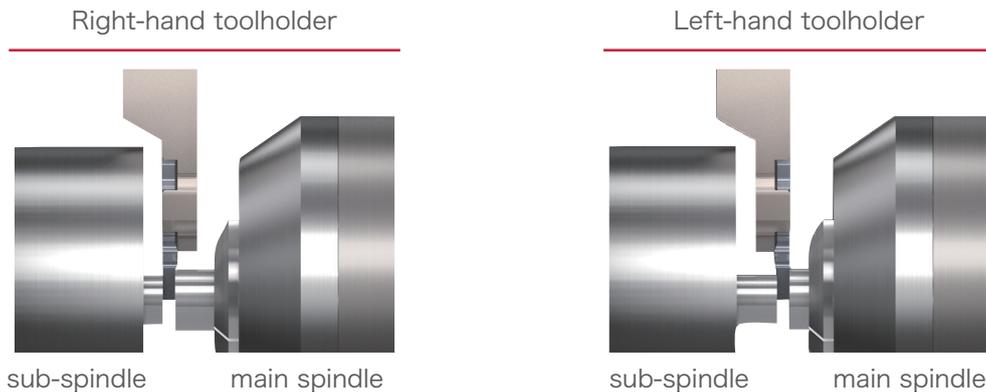
## THREE TYPES OF INSERTS AVAILABLE FOR VARIOUS DIAMETERS

DuoJust-Cut offers three different types of inserts for maximum part-off diameters of  $\phi 6\text{mm}$ ,  $\phi 12\text{mm}$ , or  $\phi 16\text{mm}$ . All three types fit both the regular toolholder and the sub-spindle toolholder, making it easier to select insert for the desired part-off diameters.



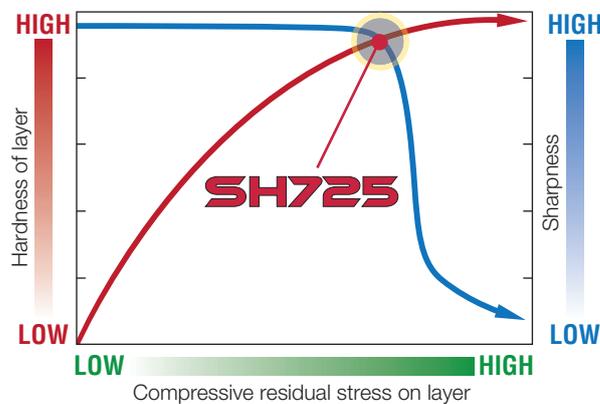
## TOOLHOLDER FOR SUB-SPINDLE WITH NARROW APPROACH

DuoJust-Cut offers toolholders for parting off components with a small diameter and a short length, where the distance between subspindle and main spindle is too narrow to approach for a standard tool holder.



## SH725: A NEW PVD GRADE FOR SWISS LATHES

When parting off small parts, cutting edge sharpness is critical in preventing deformation and burr on components. SH725 features a superior adhesion strength that has been developed to prolong tool life in parting-off various materials.



## HIGH MACHINING STABILITY REQUIRED IN SWISS-TYPE LATHES

The increasing popularity of miniature parts in difficult to machine materials, has made necessary the need for machinists to remain current with cutting tool trends if they are to remain competitive in this hyper-competitive market. DuoJust-Cut is an example of how to upgrade your tooling to remain competitive in this market.

## CASE STORY: GENERAL ENGINEERING

A hydraulic component manufacturer, unfamiliar with Tungaloy was struggling to produce a stainless steel component. The company was using traditional part off tools and was experiencing unpredictable tool life, often causing catastrophic failure. These failures damaged tools, scrapped parts and created a lot of down-time. The Tungaloy sales person introduced this customer to Tungaloy's DuoJust-Cut. DuoJust provided better surface finish and long predictable tool life doubling the tool life of the incumbent cutting tool.

**Part name:** Hydraulic component

**Material:** SUS304 (X5CrNi18-9)

**DuoJust-Cut:**

Toolholder: JSXXL1212X09-S

Insert: JXPG16L20F SH725

**Cutting conditions:**

$V_c = 75$  m/min (240 sfm)

$f = 0.02$  mm/rev (0.0004 ipr)

Groove width = 2 mm (0.008")

**Machine:** Swiss-type lathe

**Coolant:** Non-soluble

**Result:** Due to extremely tough cutting edge, DuoJust-Cut achieved excellent surface quality and doubled the tool life.



"DuoJust-Cut provides highly accurate machining and amazing long tool life in parting-off operation of small parts."

## TYPICAL PARTS:

• Small Parts

