

# 50 HRC Two Wheeler Crank Shaft Die with Millstar

**Objective**

The actual machining was conducted at a customer works to reduce the machining time of a 50 HRC 2 wheeler crank shaft die.

Process Chart for Roughing Operation	
Tool Adapter	Collet Chuck
Tool Shank	<b>CYF 16-160-16 (MILLSTAR) &amp; CBCYF 16-150-16</b>
Shank material	Steel   Carbide
Overhang	60 mm & 110mm
Insert	<b>HF 16 -TLN (MILLSTAR)   BD 16 N 1.3 -TLN</b>
Tool coating	<b>Exalon™ (AlTiN)</b>
Tool path Strategy	Z level machining
Depth of Cut	0.6 mm / pass in Roughing   0.15mm / pass – Finish
Step Over	11.20 mm   0.15mm / 4mm on Flat faces
Stock remaining	0.15 mm   0mm
Feed	<b>4800 mm/min   1500 mm / min</b>
Spindle speed	<b>4800 RPM   6000 RPM</b>
Millstar Machining time	<b>8 minutes + 34 minutes = 42 minutes !!!</b>
Previous Machining time	<b>120+ minutes</b>
Previous tools used	<b>Dia 25mm Bullnose, Dia 16 Bullnose, Dia 12 Ballnose, Dia 6 Ballnose</b>
Reduction in Machining Time	<b>77 minutes!!! (65%)</b>
Machine Used	<b>Makino Max 65</b>

**View of the Die after completion of machining**



**Want to know more on this.....read on.....**

## Machining Summary

The 50 HRC, 2 wheeler crank shaft die was machined using Millstar insert type tools. The process earlier followed was to rough machine with various types of tools and then finish machine with Millstar insert type tool. The machining time was 120 mins plus of which roughing and semi finishing took about 86 mins.

The challenge before Millstar was to fully machine the component in minimum possible time and to have a stable machining process with minimum number of tools and minimum interruptions while cutting.

The approximate size of the impression is Diameter **200 mm X 100mm**.

Machine used was Makino Max 65 VMC with 8000 RPM.

The tool was chosen to rough machine was the new introduction from Millstar, a diameter 16mm High Definition Tool (Single insert type design). The aim was to rough machine the job in minimum time using high speed machining techniques and with minimum stoppages so as to facilitate uninterrupted machining but at the same time achieving accuracies required even at roughing stage.

Depth of cut used was **0.6mm**, stepover of **11.2mm**, RPM of 4800 and feedrate of **4800mm / min !!!**. The depth of cut & step over used facilitated very high material removal rate in roughing. The cutting speed was **~ 240 meters / min**. The roughing process was completed in **8 Mins** which was a record time and a huge **reduction of 74 mins**. Semi finishing was eliminated due to smaller corner radius on the roughing tool.

The finishing operation was done with Millstar back draft insert of diameter 16mm and carbide brazed shank. The finish achieved was excellent and even at a depth of 100mm in the bore and a diameter of 17mm there were no vibrations due to superior cutting geometry of Millstar tools.

All this was possible only due to high performance tool coating and the new High feed geometry from Millstar coupled with the rock solid V Seating design which has always performed in an exceptional manner.

**The new single insert HF (High feed) insert is available starting from diameter 10mm up to diameter 25mm**

**At Millstar, we just don't sell cutting tools, we deliver the latest in cutting technology !!!**