

# 58HRC Runner Bush machining with Millstar tools



## Objective

The demo was conducted to demonstrate the high-speed, high hardness and long overhang machining capabilities of Moldstar solid carbide cutting tools.

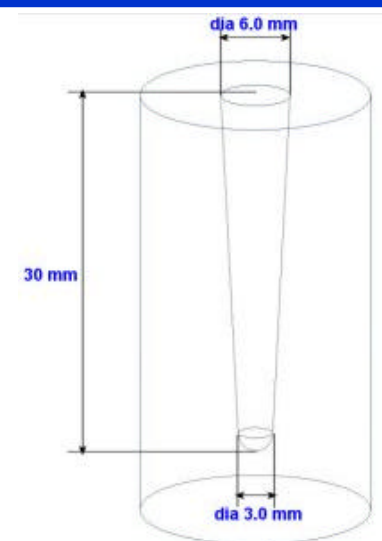
## Machining Summary

**58 HRC** steel Runner bush was machined using a 3D NC program to demonstrate the high-speed, high hardness machining capabilities of Moldstar solid carbide cutting tools.

The hardness of the steel insert machined was 58 HRC. The dimension of the hole was dia 6 mm the top and **dia 3 mm** at the bottom and a depth of **30mm**.

8000 RPM was available on the machining center used. Communication mode used was RS 232C interface.

Tool Adapter	Collet Chuck
Cutting tool	<b>BM 3.0 EX (Moldstar)</b>
Tool diameter	3 mm
Neck length	30 mm
Shank Diameter	6 mm
Tool coating	<b>Exalon™ (AlTiN)</b>
Tool path Strategy	Z level machining
Process	Roughing
Stock remaining	0.05 mm
Feed	1100 mm/min
Spindle speed	8000 RPM
Machining time	<b>4 minutes</b>



The diagram illustrates a tapered cylindrical runner bush. It features a top flange with an outer diameter of 6.0 mm and a bottom flange with an outer diameter of 3.0 mm. The central tapered section has a length of 30 mm, indicated by a vertical dimension line on the left. The drawing uses perspective to show the top and bottom circular faces and the tapered side profile.

**Schematic drawing of the runner bush**

Tool Adapter	Collet Chuck
Cutting tool	<b>BM 2.0 EX (Moldstar)</b>
Tool diameter	2 mm
Neck length	30 mm
Shank Diameter	6 mm
Tool coating	<b>Exalon™ (AlTiN)</b>
Tool path Strategy	Z level machining
Process	Finishing
Feed	800 mm/min
Spindle speed	8000 RPM
Machining time	<b>8 minutes</b>

#### Process sheet

Process	Tool	RPM	Feed	Machining Time
Roughing	Diameter 3 Ballnose endmill (Moldstar)	8000	1100mm <sup>min</sup>	4 mins
Semi finish	Diameter 2 Ballnose endmill (Moldstar)	8000	560mm <sup>min</sup>	3 mins
Finish	Diameter 2 Ballnose endmill (Moldstar)	8000	800mm <sup>min</sup>	8 mins
<b>Total Machining Time</b>		<b>15 Mins / Hole</b>		

#### Summary

Prior to this test, machining time for the runner bush hole machining in **58 HRC** insert was more than **4 hours** using **EDM process**. **Customer had tried various tools of other makes and had failed to cut the 58 HRC steel insert with convincing results**. HSMcil was invited to prove the feasibility of using the HSM process as well as proving the capability of Moldstar solid carbide cutting tools in high hardness machining application.

HSMCIL conducted this test with the **Moldstar solid carbide Ballnose endmill** which can cut high hardness steels with ease and at the same time maintain the accuracy and the finish required on the job. **The runner bush hole was completely machined in 15 mins/hole. Reduction in machining time was more than 85% from the previously used EDM process.** The finish achieved was excellent owing to the superior geometric accuracies on Millstar tools and the **Exalon™ (AlTiN)** coating. The reduction machining time gave the customer an opportunity to reduce lead times of manufacturing the mold parts by a very large extent.

This test successfully demonstrates the capability of Moldstar tools in cutting high hardness steels even with smaller diameter tools and at longer neck lengths owing to the superior carbide grades of the tools, cutting geometry and the Exalon™ (AlTiN) coating .

The cost per die is also reduced owing to the minimizing or elimination of EDM process as demonstrated in this test.

**This test cut has again proved that using Millstar tools and process results in enhancing productivity with lesser cost per die. Millstar tools have proved to be a cut above the rest!**

**With today's competitive market forces at work can you afford not to have Millstar tooling and technology at work for you?**