

MTC Newsletter 05/ 2015

# Bottle Bottom 0.5 Ltr.



In the today packing industry, the requirements on surface quality and part accuracy is extremely high. Especially in the PET bottle manufacturing an excellent shape accuracy and a shiny surface finish on the mold section is essential. In the current manufacturing process of blow bottle molds, a polishing process is required to achieve these quality needs.

Today we are able to substitute this polishing process using a state of the art high speed milling machine such as the HSM600ULP, adapted milling strategies and a high quality tools. This reduces the production costs of a mold and simplifies the production chain for our customers.

## Requirements

- Accuracy: +/- 0.01mm
- Surface quality: Ra 0.03µm

## Work piece

- Dimension: Ø80mm x 40mm
- Material: Aluminum EN AW-6082

## Machine

- Type: HSM600ULP
- Spindle: HSK E50 (36'000 rpm)

## Success factors



High quality motor spindle



Rigid polymer machine body



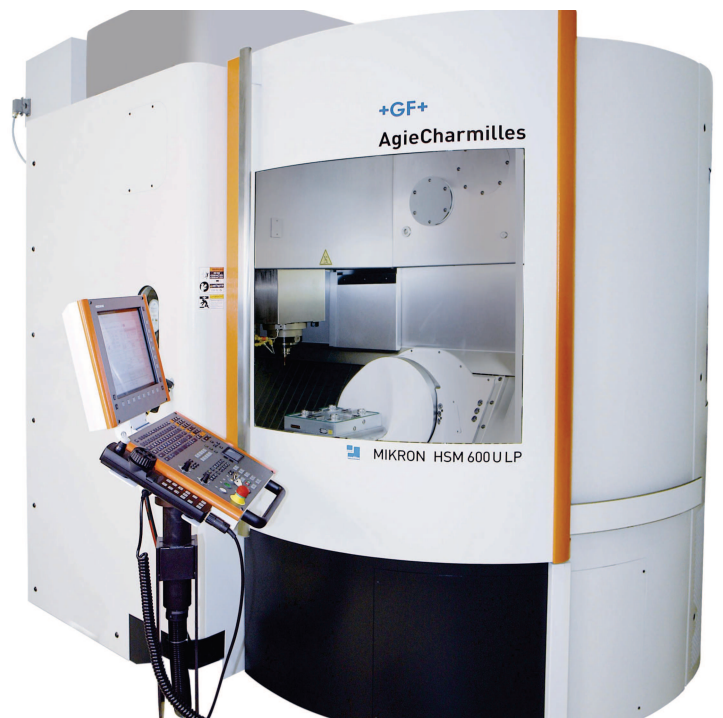
Smooth movements due to linear drives



OSS extreme

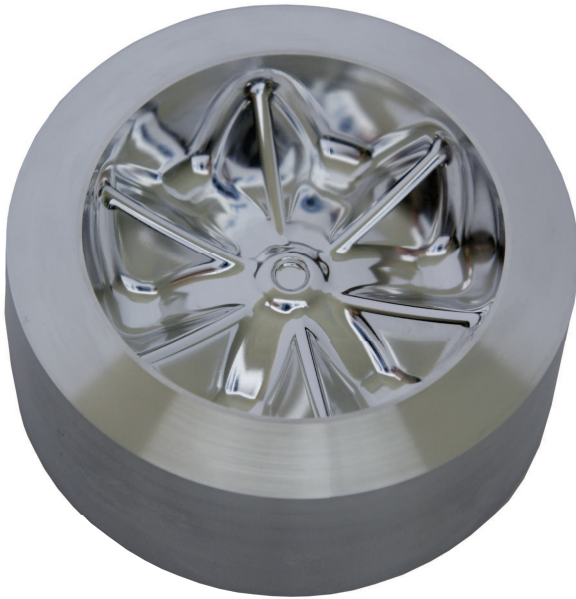


Diamond tooling

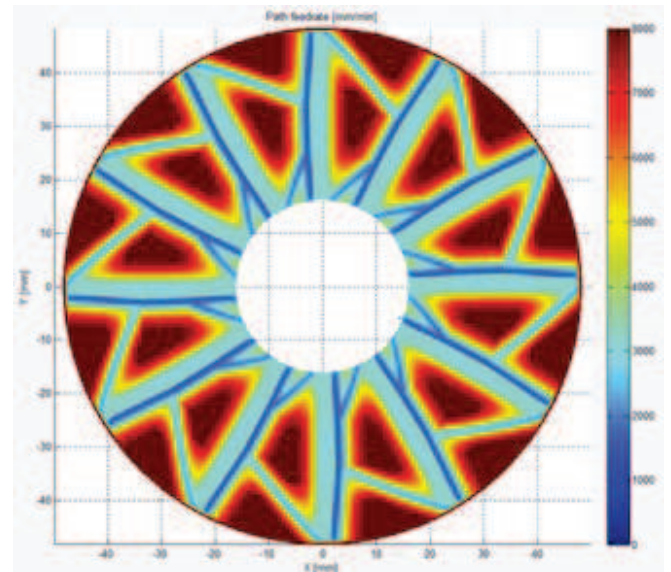
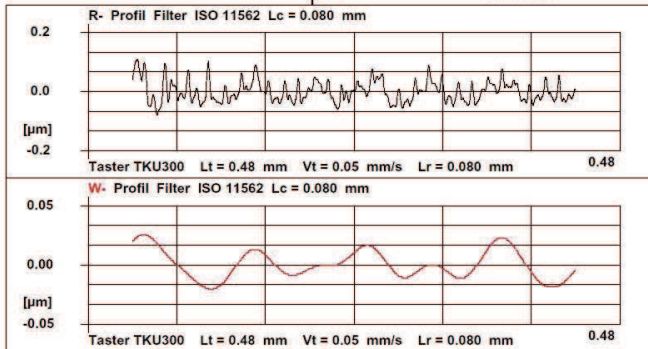


## Machining sequences

Operation	Tool	D [mm]	r [mm]	Z -	n [U/min]	Vf [mm/min]	ae [mm]	ap [mm]	t [h:mm:ss]
roughing cavity and outside	bull nose end mill	12	2	3	18'000	7'000	4.5	10	00:01:21
roughing cavity	ball nose end mill	6	3	2	32'000	9'500	1.5	1	00:01:16
semi finishing cavity	ball nose end mill	6	3	2	32'000	9'500	0.5	1	00:02:12
finishing cavity with MKD tool	ball nose end mill	4	2	1	36'000	2'000	0.04	0.05	01:04:00
finishing centre cavity with MKD tool	ball nose end mill	2	1	1	36'000	1'500	0.03	0.05	00:00:53
finishing outside	flat end mill	12	-	4	18'000	1'500	0.1	5	00:01:57
<b>total machining time</b>									<b>01:11:39</b>



Rmr(0.25*Rz)	18.63 %
Ra	0.029 µm
Rt	0.189 µm
Rz	0.147 µm



### Excellent surface quality

To achieve this shiny surface finish a smooth tool path combined with a small theoretical roughness has to be created. Together with the highly precise motion control of the HSM600ULP and a high end MKD tool, we pushed the limits in achievable surface quality.

### OSS extreme

The Operator Support System OSS is using the internal dynamic parameters and enhanced dynamic precision functions in order to optimize the machine according to the requirement of the part and the machining sequence.