

# 4845

# Machining Guideline

The aim of this machining guide is to be an introduction to fabricators machining in 4845. The machining parameters in this guideline will work under normal machining conditions.

## Machining heat resistant austenitic stainless steel

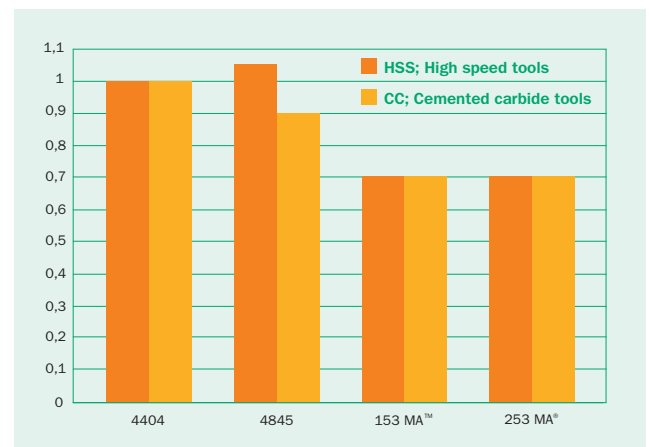
Outokumpu 4845 has machinability comparable to Outokumpu 4404 and considerably better than other high alloyed heat resistant stainless steel.

- Ensure a stable setup – Higher cutting forces compared to standard austenitic grades
- Use sharp tools in order to generate less heat and minimize work hardening
- Coolant – Less heat results in a longer tool life

### Machinability ranking

The machinability of different stainless steel grades can be illustrated by a machinability ranking. This ranking, where a higher figure means better machinability, is based on a combination of test data from several different machining operations. The ranking shows that 4845 is similar to machine in relation to 4404 in spite of its fairly high alloy content. Please note the relative ranking of steel grades and that the scale is very different between Cemented Carbide CC and High Speed Steel HSS tools which is demonstrated in the tables below.

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### Turning

- The machine and setup must be rigid
- Use carbide grade M20-M25 or P20-P25
- Always use coolant
- Use smallest possible nose radius to avoid vibrations

### Cutoff turning

- The machine and setup must be rigid
- Use carbide grade M20-M25 or P20-P25
- Always use coolant

	Cemented carbide		HSS
	Roughing	Finishing	Finishing
Cutting speed $v_c$ (m/min)	110-140	140-190	18-23
Feed $f_z$ (mm/rev)	0.3-0.6	0.05-0.3	0.05-0.2
Depth of cut $a_p$ (mm)	2.0-5.0	0.5-2.0	0.5-2.0

	Cemented carbide	HSS
Cutting speed $v_c$ (m/min)	110-120	18-23
Feed $f_z$ (mm/rev)	0.08-0.10	0.05-0.08

## Milling

- Use shortest possible tool length
- Avoid cutting through holes/cavities
- Ensure good chip evacuation. Recutting of chips may cause tool damage

	Cemented carbide		HSS	HSS
	Roughing	Finishing	Slot milling	Face milling
Cutting speed $v_c$ (m/min)	150-190	190-220	20-25	14-17
Feed $f_z$ (mm/tooth)	0.2-0.4	0.1-0.2	0.01-0.09	0.1
Depth of cut $a_p$ (mm)	2-5	1-2		

## Drilling

- Always use coolant
- If possible use internal coolant through the drill
- Stable setup is very important when drilling through holes

	Cemented carbide	HSS
	Indexable drill	Twist drill
Cutting speed $v_c$ (m/min)	130-180	6-12
Feed $f_z$ (mm/rev)	0.08-0.15	0.05-0.35

## Threading

- Use of a plunge infeed normally gives the best result
- For internal threading reduce the cutting speed by about 30%
- Use coolant

	CC	HSS	HSS
	Single point	Single point	Tapping
Cutting speed $v_c$ (m/min)	80-100	15-20	7-10
Number of passes	7-12	10-16	

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