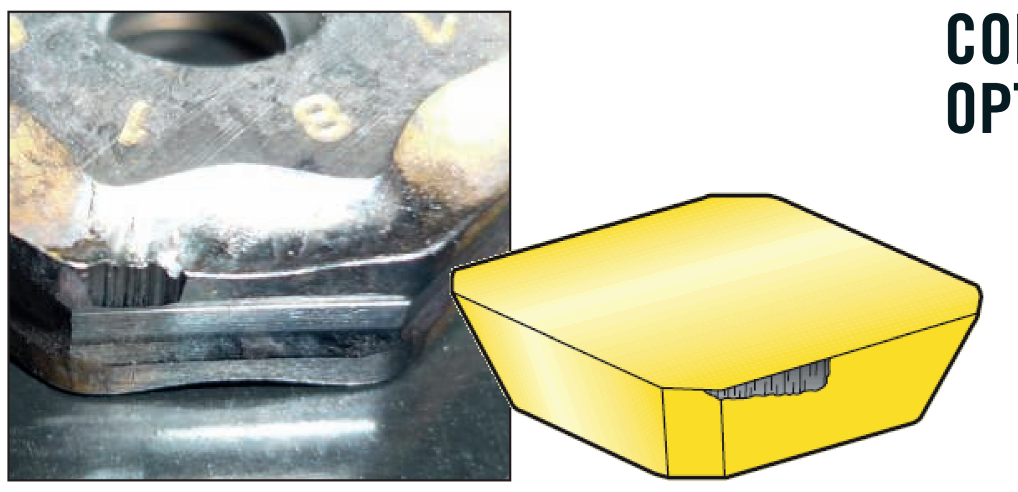
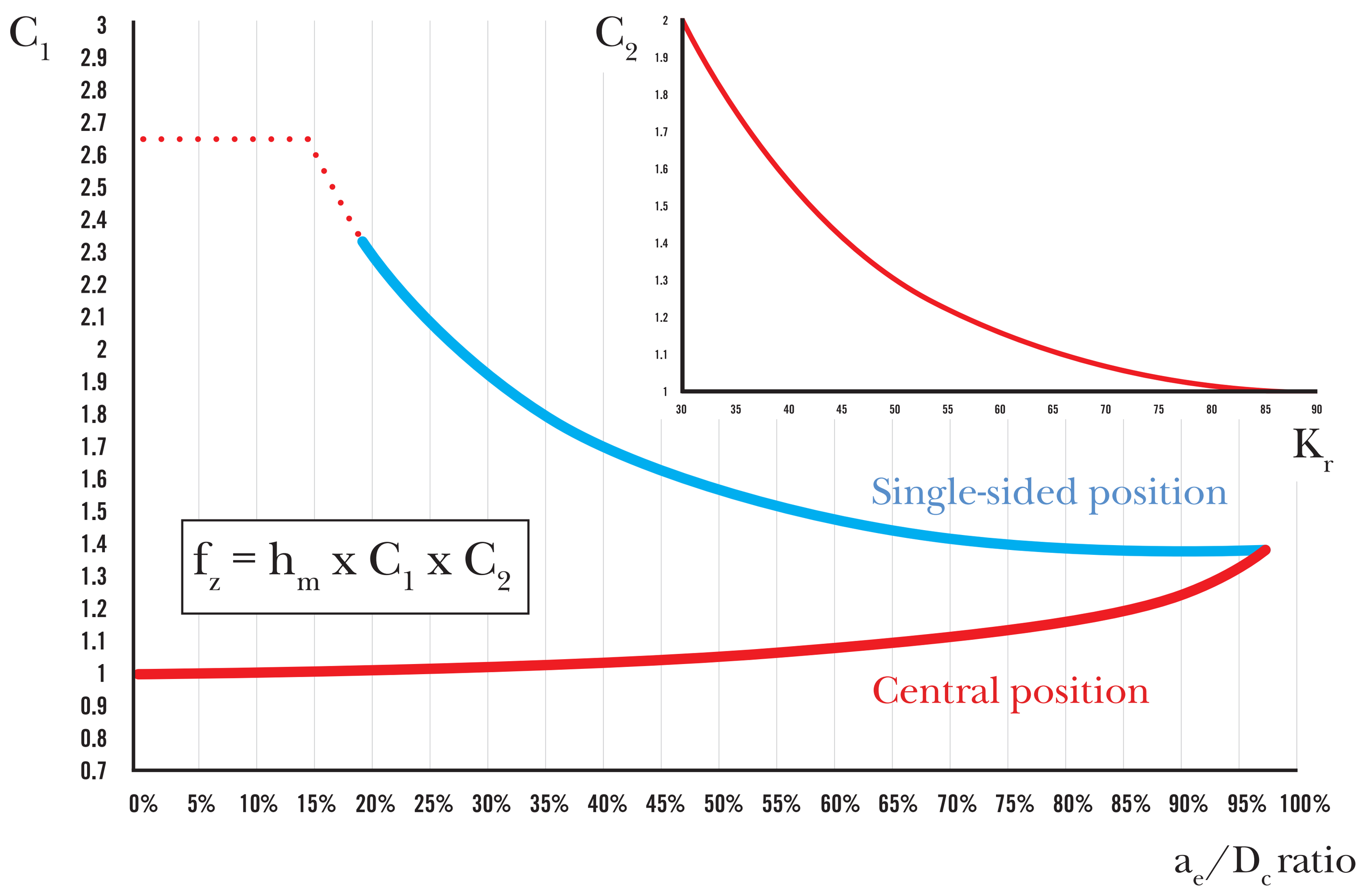
MILLING
MACHINING OPTIMISATION TECHNIQUE

OUR MAIN TARGETS:
CUTTING CONDITIONS FOR BEST PERFORMANCE & CONTROLLED TOOL WEAR

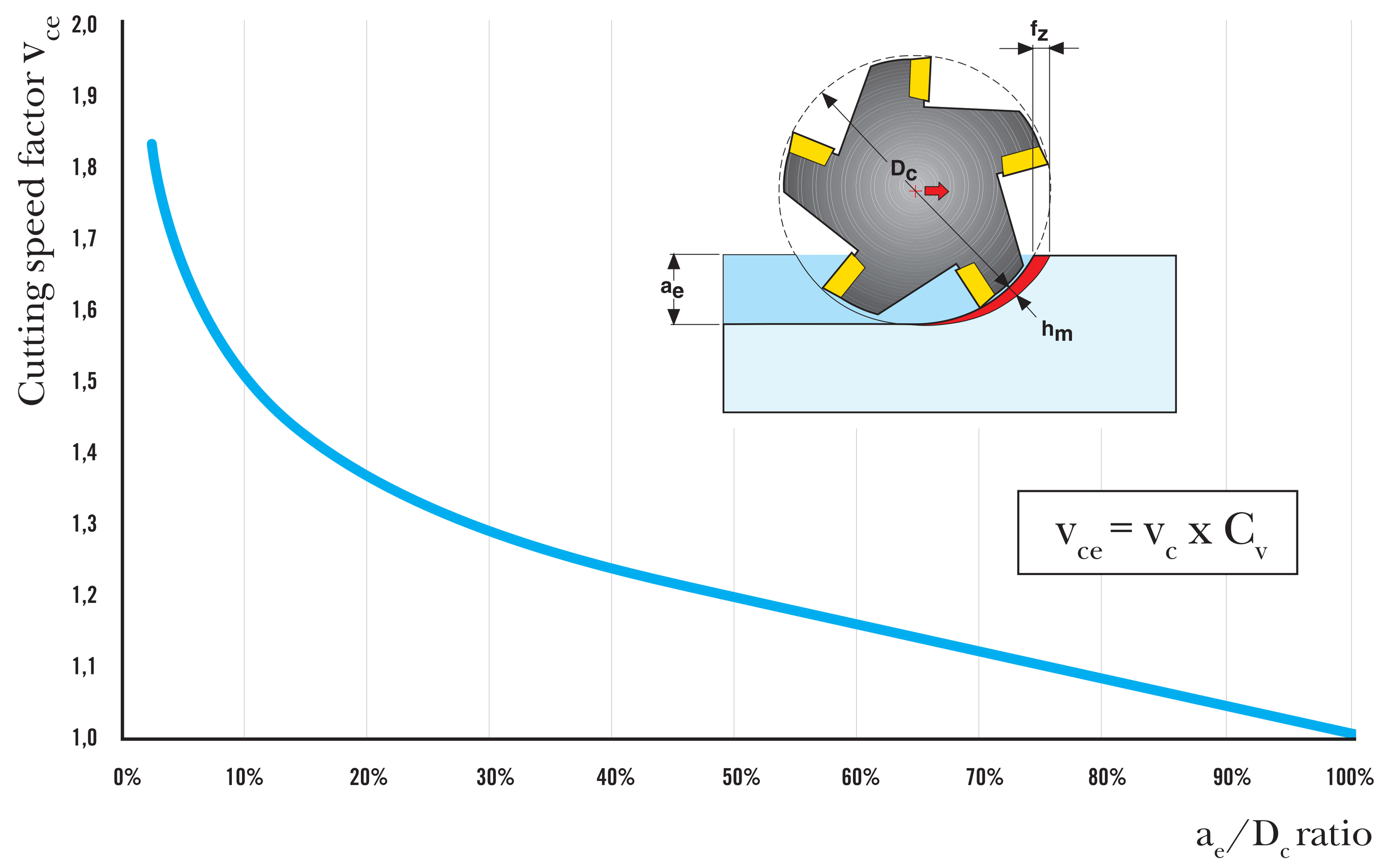


CONTROLLED TOOL WEAR: OPTIMUM FLANK WEAR

1. FEED - AVERAGE CHIP THICKNESS



2. EFFECTIVE CUTTING SPEED



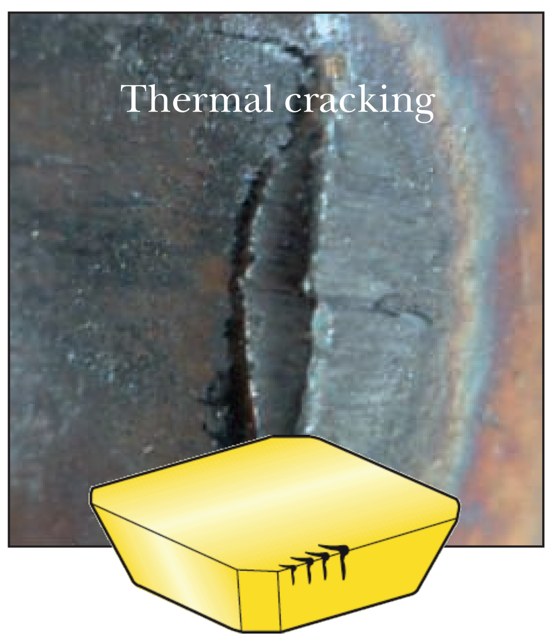
INPUT

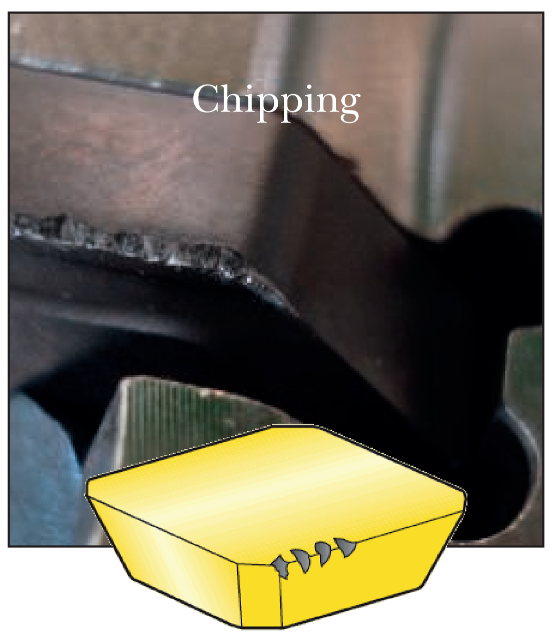
- D_c = 100 mm
- a_e = 20 mm
- v_c = 200 m/min for a_e = 100 mm (as advised in Machining Navigator)
- h_m = 0,05 mm (advised in MN)
- Single-sided milling with milling cutter: K_r = 45°

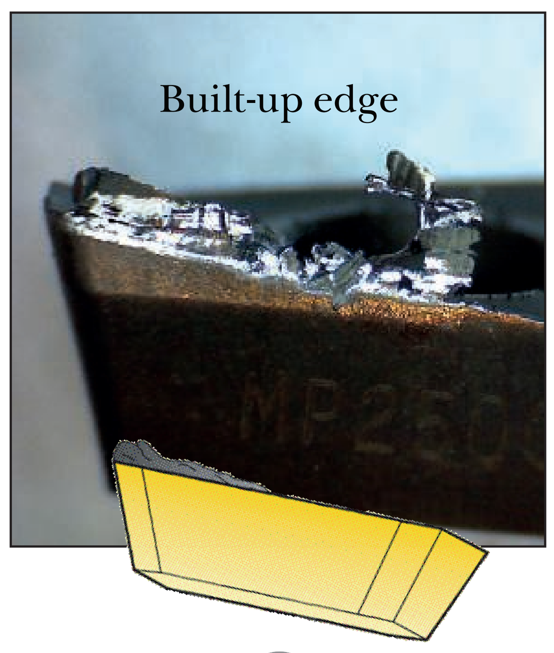
APPLICATION

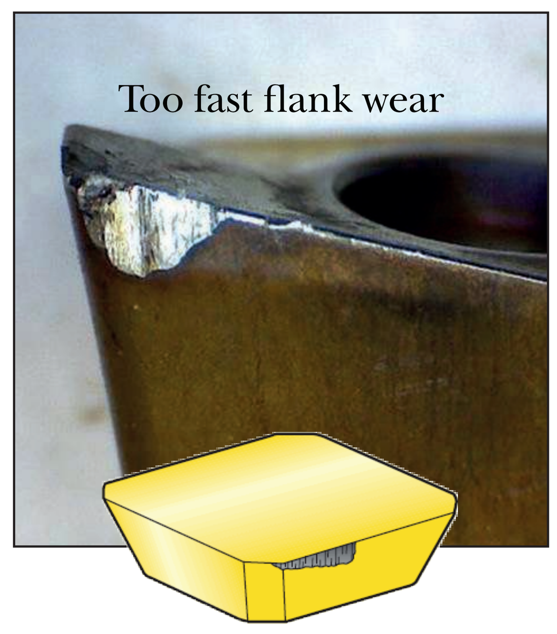
- a_e/D_c = 20 % and single-sided milling -> C_1 = 2,3
- K_r = 45° -> C_2 = 1,4
- f_z = 0,05 x 2,3 x 1,4 = 0,16 mm/tooth
- a_e/D_c = 20 % -> C_v = 1,35
- v_{ce} = 200 x 1,35 = 270 m/min

3. CONTROLLED TOOL WEAR









	Notch wear	Thermal cracking	Chipping	Built-up edge	Point wear	Too fast flank wear
v_c (m/min)	−	−	+	+	−	−
Carbide grade*	−	−	−	−	+	+
Feed (f_z)	+	−	−	+	−	+
Geometry**	−	+	−	+	−	+

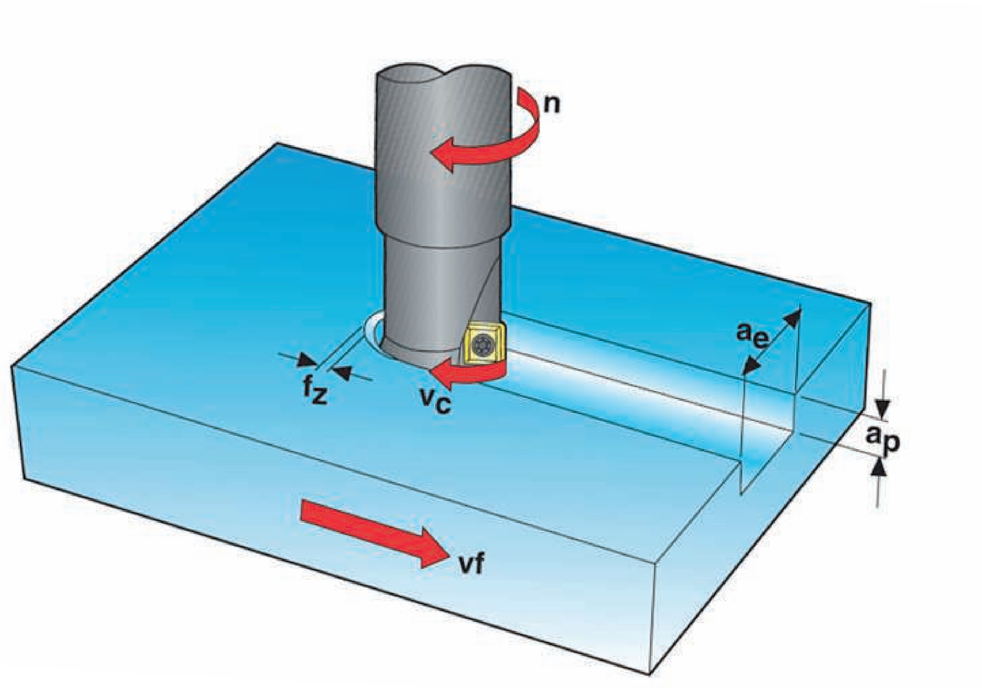
* More wear resistant + ⟷ Tougher −

** Sharper cutting edge + ⟷ Stronger cutting edge −

4. CUTTING CONDITIONS

Make sure the milling operation is done in the best circumstances possible:

- Correct tool positioning
- Most stable milling cutter
- No vibrations
- Good chip evacuation



FORMULAE

Rotational speed / cutting speed:

$$n = \frac{v_c \times 1000}{\pi \times D_c} \text{ [rpm]}$$

$$v_c = \frac{n \times \pi \times D_c}{1000} \text{ [m/min]}$$

Table feed / feed per rotation:

$v_f = n \times Zc \times f_z$ [mm/min]

$f = Zc \times f_z$ [mm/rev]

This schedule represents the majority of cases. For specific cases in unfavourable circumstances or for specific measurements, please contact your business partner at Seco.