



TECHNICAL INFORMATION
PROFILE SHAPER CUTTERS

APPLICATION OF SHAPER CUTTERS WITH HM KNIVES:

Shaper cutters with sintered carbide knives are recommended especially for the treatment of solid hard wood, laminated wood, chipboard, solid fibreboard and OSB.

APPLICATION OF SHAPER CUTTERS WITH HSS KNIVES:

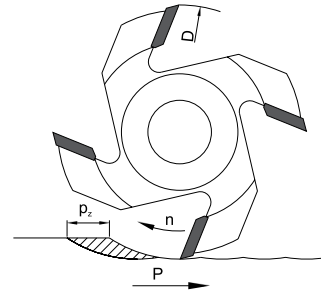
Shaper cutters with high-speed steel knives are recommended for the treatment of wet and dry softwood.

Tools marked with  are used with a mechanical feed. Tools marked with  are used with a manual feed.

CUTTING PARAMETERS:

The condition for the correct operation of shaper cutters is to choose the right cutting speed and feed rate for the type of material which is to be worked on and machining conditions

material	shaper cutters with HM knives cutting speed [m/s]	shaper cutters with knives HSS cutting speed [m/s]
Softwood	60-90	50-80
Hardwood	50-80	-
Chipboard	60-80	-
Blockboards and glued laminated timber	50-80	-
Hardboard	30-50	-



CALCULATION OF CUTTING SPEED:

$$V = \frac{\pi \times D \times n}{60 \times 1000}$$

V – cutting speed (m/s)
D – outside diameter of the shaper cutter (mm)
n – spindle speed (rev/min)

Example:
outer diameter of the shaper cutter D = 140 mm, spindle speed n = 6500 rev/min

$$V = \frac{\pi \times 140 \times 6500}{60 \times 1000} = 47,6 \text{ m/s}$$

Attention: When determining the optimum cutting speed, do not exceed the maximum speed indicated on the shaper cutter.

CALCULATION OF FEED RATE:

$$P = \frac{p_z \times z \times n}{1000}$$

P – feed rate (m/min)
p_z – feed per tooth (mm)

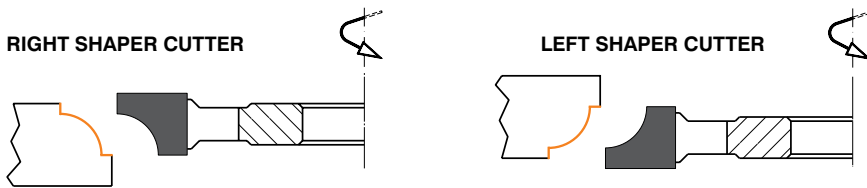
finishing: p_z = 0.25 – 0.75 (mm)
roughing: p_z = 0.8 – 2.5 (mm)

z – number of teeth
n – spindle speed (rev/min)

Example:
spindle speed n = 6500 rev/min, number of teeth z = 4, softwood finishing p_z = 0.4 mm

$$P = \frac{0,4 \times 4 \times 6500}{1000} = 10,4 \text{ m/min.}$$

DIRECTION OF ROTATION OF SHAPER CUTTERS (RIGHT SHAPER CUTTERS, LEFT SHAPER CUTTERS):



DETERMINING THE MINIMUM OUTER DIAMETER OF A PROFILE CUTTER DEPENDING ON THE PROFILE DEPTH:

D – outside diameter (mm)
D – edging pass diameter (mm)
B – shaper cutter width (mm)

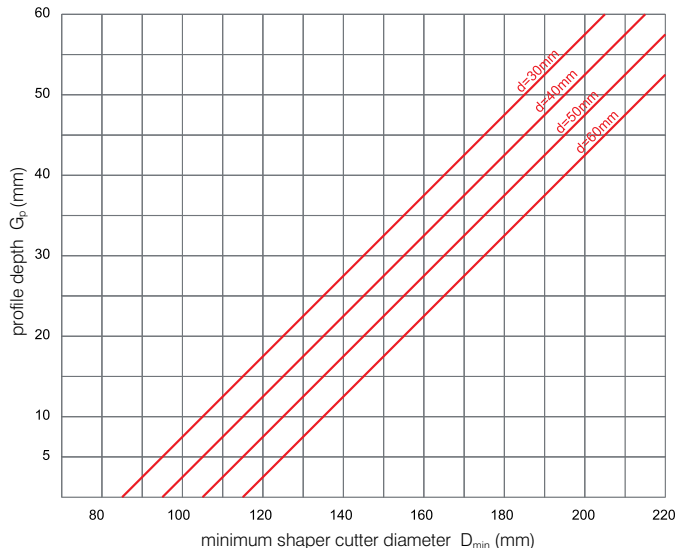
Maximum outer diameter D_{min} (mm) D_{min} = 2xG_p + d + 55

$$D_{min} = 2 \times G_p + d + 55$$

D_{min} – minimum shaper cutter diameter (mm)
G_p – profile depth (mm)
d – edging pass diameter (mm)

Example:
profile depth G_p = 20 mm, edging pass diameter of the shaper cutter d = 30 mm

$$D_{min} = 2 \times 20 + 30 + 55 = 125 \text{ mm}$$



CL530 **DIAGRAM INFORMATION**
SHAPER CUTTERS WITH BRAZED HSS KNIVES

Shaper cutter sets are manufactured for multi-sided machinery according to diagram "1".

Upon request, we make shaper cutters according to diagram "2".

For single-sided machines (milling machines), we make shaper cutters according to diagram "3". It is also possible to make a different version than shown in the diagrams.

