

**Garant**
**Solid carbide milling cutter with chip separators TPC, TiAlN, Ø f8 DC: 12mm**

**Order data**

Order number	203092 12
GTIN	4045197953872
Item class	11X

**Description**
**Version:**

High-performance end mill for general-purpose applications, **specially designed for TPC applications.**

Strengthened core.

**Optimised bending strength** due to the use of ultra-fine grain substrates.

**Offset chip breakers for controlled chip breaking.**

**Note:**

$h_{max}$ : The values stated in the table are maximum values. For finishing operations we recommend items No. 204012, 204014 and 204015.

$a_{e,max} = 0.07 \times D$  for TPC machining.

**Successor product to No. 203089.**

**Technical description**

Shank Ø $D_s$	12 mm
Overall length L	93 mm
Direction of infeed	horizontal and oblique
Balance quality with shank	G 2.5 with HB
Corner chamfer width at 45°	0.24 mm
Tolerance nominal Ø	f8
No. of teeth Z	5
Cutting edge Ø $D_c$	12 mm
Shank	DIN 6535 HB to h6

Recess $\varnothing D_1$	11.8 mm
Overhang length $L_1$ incl. recess	45 mm
Helix angle	40 degrees
Average chip thickness $h_{\max}$ for TPC milling in Toolox 44 HRC	0.06 mm
Flute length $L_c$	36 mm
Corner chamfer angle	45 degrees
Number of chip separators	2
Coating	TiAlN
Tool material	Solid carbide
Standard	Manufacturer's standard
Type	N
Helix angle characteristic	unequal spacing
Spacing of the cutters	unequal spacing
Cutting width $a_e$ for milling operation	$0.07 \times D$
Through-coolant	no
Machining strategy	TPC
Colour ring	green
Type of product	End / face mill

## User data

	Suitability	$V_c$	ISO code
Steel < 500 N/mm <sup>2</sup>	suitable	380 m/min	P
Steel < 750 N/mm <sup>2</sup>	suitable	340 m/min	P
Steel < 900 N/mm <sup>2</sup>	suitable	300 m/min	P
Steel < 1100 N/mm <sup>2</sup>	suitable	230 m/min	P
Steel < 1400 N/mm <sup>2</sup>	suitable	150 m/min	P
TOOLOX 33	suitable	60 m/min	H
TOOLOX 44	suitable	40 m/min	H

HARDOX 500 < 1600 N/mm <sup>2</sup>	suitable	25 m/min	H
INOX < 900 N/mm <sup>2</sup>	suitable	220 m/min	M
INOX > 900 N/mm <sup>2</sup>	suitable only under restricted conditions	150 m/min	M
Uni	suitable		
wet maximum	Suitable		
dry	Suitable only under restricted conditions		
Air	suitable		