

\_EXPERTISE IN MACHINING

# ConeFit™ – for maximum flexibility.



# ConeFit™ – Modular system for milling

## THE TOOL SYSTEM

- Modular solid carbide milling system with self-centring thread (patent pending)
- Maximum concentricity thanks to conical centring
- The axial planar contact face ensures excellent rigidity
- Diameter range from 10 to 25 mm
- Extensive range of high-performance changeable heads for machining a wide variety of materials from ISO groups P, M, K, N, plus geometries for machining graphite
- TAX, TAZ, diamond (DIA) coating
- Steel and solid carbide shanks in different designs and lengths in mm and inches
- Monoblock adaptors in HSK63, SK40, MAS BT 40 and Capto C5 and C6

## THE APPLICATION

- For the ISO material groups P, M, K, N, S, O
- For roughing and finishing all contours and machining an extremely wide variety of different shapes
- For use in general mechanical engineering, the automotive, energy, aerospace and mould and die making industries.

## SPADE

- Low-cost Spade type variant
- Directly extruded including chip clearance
- Diameter range from 10 to 16 mm

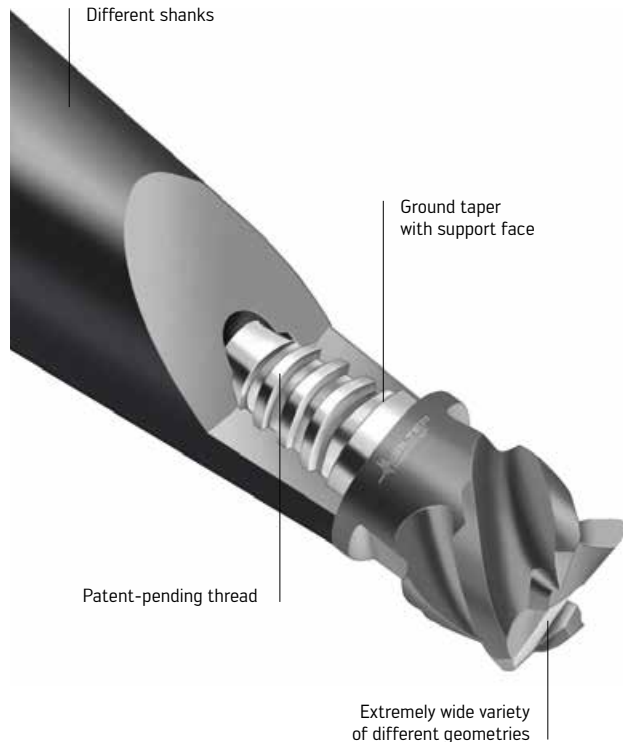
## THE APPLICATION

- Plunge milling, chamfering, centre-marking or spot-facing of holes



N 10 Copy mill with 2 cutting edges

H1E0111



## BENEFITS FOR YOU

- Modular design with different shank variants
- Extremely wide variety of different tool geometries
- Extremely high level of stability and precision due to planar and tapered contact surface with patented self-centring thread
- Long tool life in graphite machining applications thanks to special diamond coating and new geometries
- Large chip clearance on the Spade variant

# ConeFit™ – Selected examples from the range

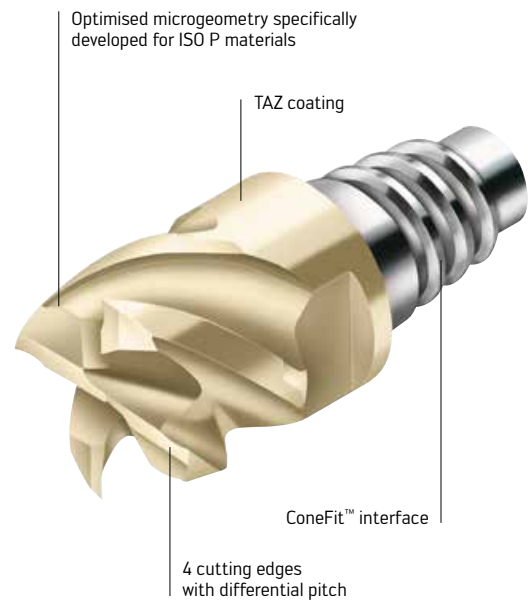
## Tool for graphite machining



4 cutting edges with corner radius

H3E20419 metric

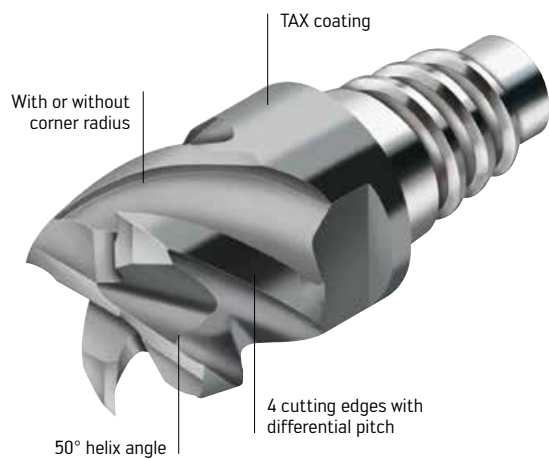
## Tool for steel machining



Proto-max™ ST

H4E34217 metric  
H4E38217 metric with corner radius

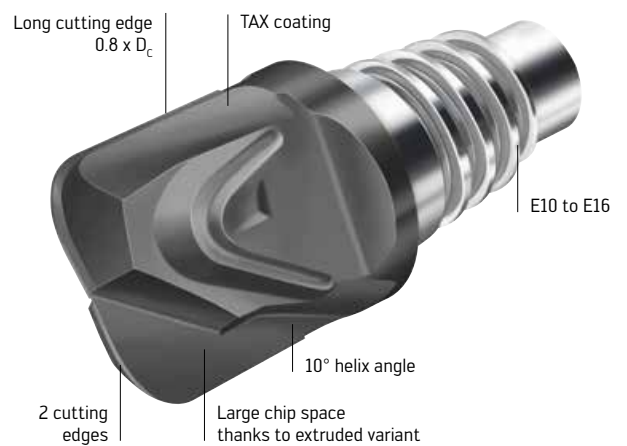
## Tough Guys – For universal application



N 50 Tough Guys

H3E21317  
H3E20317 with corner radius

## ConeFit™ Spade high-feed cutter with special Flash geometry



N 10 Spade

H3E21317  
H3E20317 with corner radius

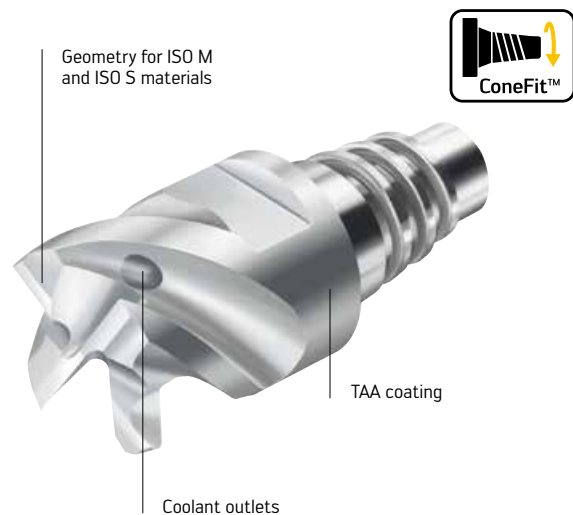
# Proto-max™ Inox with ConeFit™ interface

## THE TOOL

- A solid carbide high-performance end mill specially designed for machining stainless steels
- Available with and without corner radius
- Corner radius from 0.5 to 4 mm
- Diameter range from 10 to 25 mm
- 50° helix angle
- 4 and 5 cutting edges
- ConeFit™ interface from E10 to E25
- TAA coating

## THE APPLICATION

- Primary application: ISO material group M
- Secondary application: ISO material group S
- For roughing and finishing
- Machining full slots up to  $0.55 \times D_c$
- Pocket milling, inclined plunging and contour milling
- Ideally suited to machines with an internal coolant supply
- Areas of use: General mechanical engineering, and the energy, medical and aerospace industries



Proto-max™ Inox with ConeFit™ interface

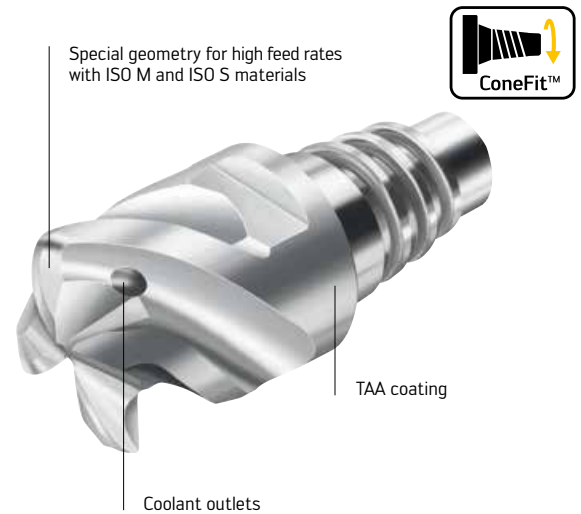
H2EC34217 metric  
H2EC38217 metric with corner radius

## BENEFITS FOR YOU

- Maximum metal removal rates which are up to 50% higher than the conventional modular tools on the market
- High metal removal rates which lead to high productivity when machining of stainless steels
- Low-vibration running due to the special helix and pitch
- Soft cutting action thanks to optimised microgeometry
- The highest level of process reliability through optimum chip evacuation due to the internal coolant supply
- Maximum tool life thanks to state-of-the-art TAA coating and internal coolant supply

## THE TOOL

- Solid carbide high performance cutter with special high-feed geometry for machining stainless steels
- Diameter range from 10 to 25 mm
- 50° helix angle
- 4 cutting edges
- ConeFit™ interface from E10 to E25
- TAA coating



Proto-max™ IncoX with flash profile

H2EC94717

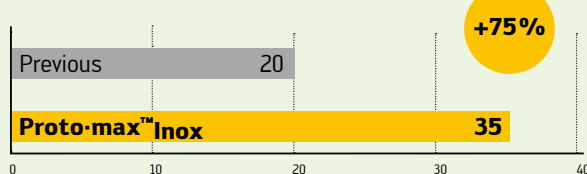
## Demo workpiece

Workpiece material: X6CrNiMoTi17 (1.4571) ISO M  
 Tensile strength: 700 N/mm<sup>2</sup>  
 Tool: Proto-max™ IncoX with ConeFit™ interface  
 H2EC38217-E12-12-0.5

### Cutting data

	Previously without internal cooling	Proto-max™ IncoX with internal cooling
Ø	12 mm	12 mm
z	4	4
a <sub>e</sub>	10 mm	10 mm
a <sub>p</sub>	2 mm	2 mm
v <sub>c</sub>	82 m/min	82 m/min
n	2200 rpm	2200 rpm
f <sub>z</sub>	0.05 mm	0.05 mm
v <sub>f</sub>	433 mm/min	433 mm/min

### Tool life in metres









# ConeFit™ – System overview

**100 % flexibility**

All adaptors accommodate all cutters



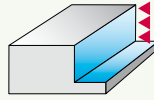
Cylindrical adaptors

-  Type B Carbide AK610...C
-  Type A Carbide AK610...C
-  Type C Steel AK610
-  Type B Steel AK610
-  Type A Steel AK610
-  Type A Steel reinforced AK610

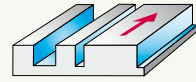
Monoblock adaptors

-  Walter Capto™ C5 + C6 AK681
-  HSK 63A AK631
-  SK40 + MAS-BT 40 AK641

## Shoulder milling



## Slot/shoulder milling



With radius

N 50  
H3E23138

N 50  
H3E21138

Proto-max™ Inox  
H2EC34217

AL 45  
Z = 3  
H6E2211

AL 45  
Z = 2  
H6E2511

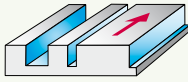
Qmax F 40  
H3E82378

Qmax F 45  
H3E85378

Proto-max™ ST  
H4E34217

Tough Guys  
H3E21317

## Slot/shoulder milling with corner radius



With Flash profile



Proto-max™ Inco  
H2EC94717



Proto-max™ Inco  
H2EC38217

Spade with radius



N 10  
H1E12018

With radius



N 50 for graphite  
H3E20419

With radius



Flash  
Z = 4  
H3E94718

With radius



Flash  
Z = 3  
H3E93718

Spade with radius



Flash  
Z = 2  
H1E92718

With radius



AL 45  
H6E2311

With radius



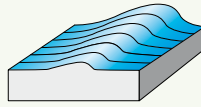
Proto-max™ ST  
H4E38217

With radius



Tough Guys  
H3E20317

## Copy milling



Spade



N 10 for graphite  
Z = 2  
H1E01219

Spade



N 10  
Z = 2  
H1E01118

Spade



N 10  
Z = 2  
H1E0111

N 40



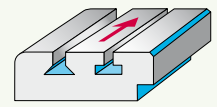
Z = 2  
H8E01118

N 40



Z = 4  
H8E11118

## Profile milling



Spade



Chamfer milling  
cutter 60°  
Z = 2  
H1E58518

Spade



Chamfer mill  
90°  
Z = 2  
H1E58318

Spade



Chamfer milling  
cutter 120°  
Z = 2  
H1E58118

Spade



Chamfer milling  
cutter 150°  
Z = 2  
H1E58018

Spade



Chamfer milling  
cutter 60°  
Z = 4-6  
H3E58518

Spade



Chamfer mill  
90°  
Z = 4-8  
H3E58318

Spade









Chamfer milling  
cutter 120°  
Z = 6  
H3E58118

Spade



Corner rounding  
end mill  
Z = 4  
H3E68118

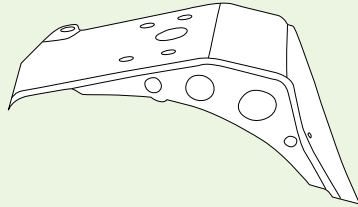
# ConeFit™ – Tool description (selected examples)

Features	Tool type	Remarks on field of application	Workpiece material group							Helix angle	Coating
			P	M	K	N	S	H	O		
			Steel	Stainless steel	Cast iron	NF metals	Difficult-to-machine materials	Hard materials	Other		
Roughing	<b>Qmax</b> 	<b>Qmax HR</b> – Solid carbide roughing milling cutters with HR Kordel profile – Without internal cooling – Can be used purely for roughing operations – Particularly suitable for unstable conditions	•	••	•					45° / 50°	TAX
	<b>Flash</b> 	<b>N 50 to 55 HRC</b> – Solid carbide milling cutters with special end geometry for Hi-Feed machining – Without internal cooling – For universal use	••	•	•	••		•		50°	TAX
Roughing/finishing	<b>Proto-max™ ST</b> 	<b>4-edge tools</b> – Solid carbide high performance cutters for machining slots to a depth of 0.4 x D <sub>C</sub> – With or without corner radius – Specially developed for steel materials, but also includes stainless materials	••	•						50°	TAZ
	<b>Tough Guys</b> 	<b>N 50 to 48 HRC</b> – Solid carbide high performance cutters with or without corner radius – For universal use	••	•	•		•	•		50°	TAX
	<b>Ball-nose copy mills</b> 	<b>N 10 to N 40</b> – 2 to 4 cutting edges – With centre cut – For roughing, semi-finishing and finishing contours	••	•	••	••				10° / 40°	Uncoated / TAX
Finishing	<b>Multipurpose cutters</b> 	<b>N 50</b> – Solid carbide high performance cutters with 6 to 8 cutting edges – D <sub>C</sub> Diameters from 10 to 25 mm – 50° helix angle specially developed for finishing operations	••	•			•			50°	TAX



# ConeFit™ – Application examples

## Support arm: Contour milling

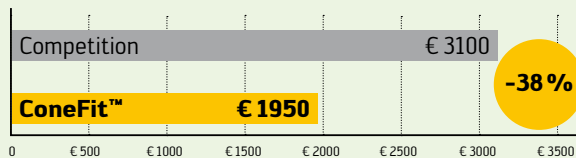


**Workpiece material:** 1.4301 (XCrNi1810) Stainless Steel  
**Tool:** ConeFit™ Tough Guys  
 H3E20317-E16-16-2  
 Diameter 16 mm, Z=4, R=2

### Cutting data

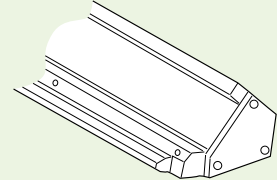
	Competition	ConeFit™
$v_c$	126 m/min	126 m/min
$n$	2507 rpm	2507 rpm
$z$	4	4
$f_z$	0.07 mm	0.07 mm
$V_f$	700 mm/min	700 mm/min
$a_p$	5 mm	5 mm
$a_e$	8 mm	8 mm

### Total costs per batch (in EUR)



**The result:**  
 Reduction of tool costs by 63%

## Valve bank: Slot milling

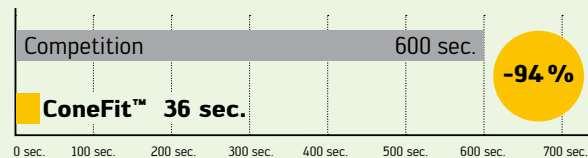


**Workpiece material:** 1.4301 (XCrNi1810) Stainless Steel  
**Tool:** ConeFit™ ball-nose copy mill  
 H8E11118-E16-16  
 Diameter 16 mm, Z=4, R=8

### Cutting data

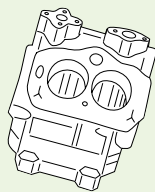
	Competition	ConeFit™
$v_c$	50 m/min	134 m/min
$n$	995 rpm	2666 rpm
$z$	4	4
$f_z$	0.04 mm	0.09 mm
$V_f$	150 mm/min	975 mm/min
$a_p$	3 mm	5.9 mm
$a_e$	8 mm	8 mm

### Machining time per component (in seconds)



**The result:**  
 Reduction of machining time by 94%, with simultaneous increase from 7 to 15 components per tool.

## Supercharger block: Shoulder milling

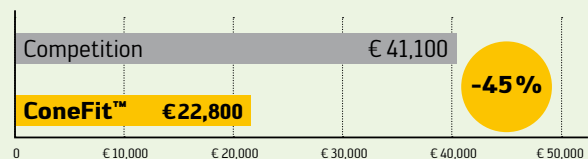


### Cutting data

	Competition	ConeFit™
$v_c$	212 m/min	230 m/min
$n$	2700 rpm	2930 rpm
$z$	4	8
$f_z$	0.03 mm	0.06 mm
$V_f$	324 mm/min	1405 mm/min
$a_p$	2 mm	2 mm
$a_e$	18 mm	18 mm

**Workpiece material:** 0.7060 (GGG60) SG Iron  
**Tool:** ConeFit™ N 50 multi purpose cutter  
 H3E21138-E25-25  
 Diameter 25 mm, Z=8

### Total costs (in EUR)

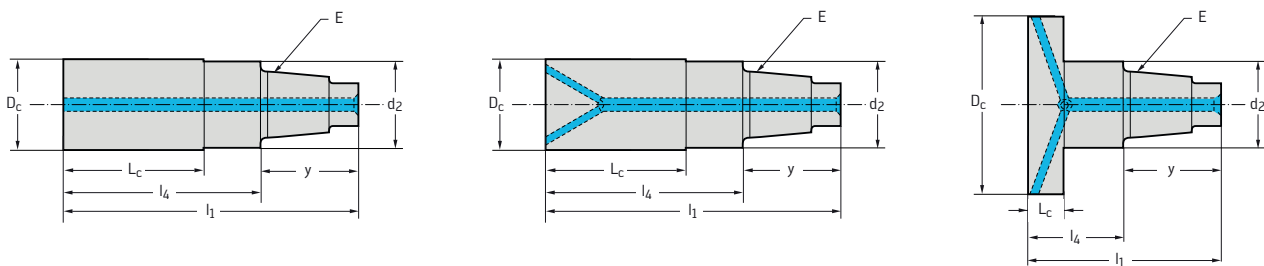


**The result:**  
 Reduction of machining time by 54% and therefore a cost saving of 45%.

# ConeFit™ – Solutions for special tools from blanks

## Blanks for special forms

- For manufacturing special solutions, such as a T-slot cutter with ConeFit™ interface
- Available with the interface sizes E10, E12, E16, E20 and E25



## Tabular overview for overlength blanks (up to 1.5 x D<sub>c</sub>)

- For manufacturing special solutions with ConeFit™ interface
- Available with the interface sizes E10, E12, E16, E20 and E25

D <sub>c</sub> mm	L <sub>c</sub> mm	d <sub>2</sub> mm	l <sub>2</sub> mm	l <sub>4</sub> mm	d <sub>1</sub>
10,2	15,8	9,7	33,4	22,6	E10
12,2	18,8	11,7	40,1	26,7	E12
16,2	24,8	15,5	51,5	34,9	E16
20,2	30,8	19,3	60,1	41	E20
25,2	38,3	24,2	74,1	50,5	E25



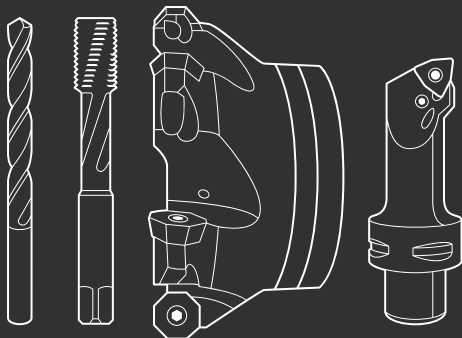
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