



GrooveLine



For more information

Face grooving

**FACE**<sup>INI</sup>**MCUT**

Tungaloy Report No. 562-G

# New ultimate deep face grooving tool







## FACE M<sup>INI</sup> CUT

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Product Video

Extremely rigid insert clamping and superior chip evacuation

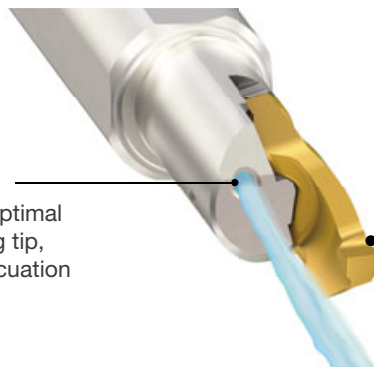
## Deep face grooving of up to 10 mm DAXN and up to 9 mm groove depth is possible

- Effectively removes chips out of the cutting area and eliminates bird nesting
- Extremely rigid insert clamping ensures tool stability during deep face grooving operations
- Sharp cutting edge, combined with SH7025, the latest PVD grade, provides long tool life and superior surface quality

### 1 Superior chip evacuation

#### Internal coolant system

- Coolant is directed to the optimal position close to the cutting tip, allowing excellent chip evacuation during deep face grooving



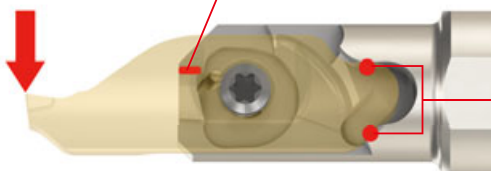
#### Effective chip redirector

- Optimized geometry that effectively redirects chips out of the groove and to the side
- Eliminates bird nesting of chips during machining

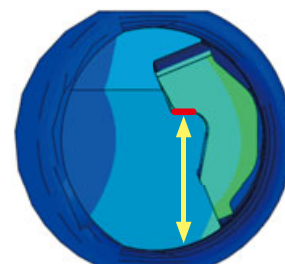
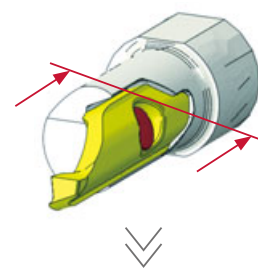
### 2 High clamping rigidity

Additional support which sustains the cutting force

Cutting force



Fixed to position the insert



#### Sustains the cutting force

- Thick section of the pocket, eliminating chatter

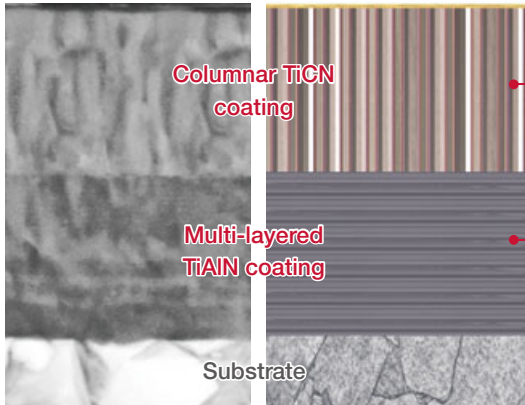
### 3 SH7025 - the latest PVD insert grade for superior surface quality and process security



## SH7025

- The latest grade with sharp cutting edge designed for small part machining.
- A combination of a columnar-structured TiCN coating and multilayered TiAlN coating provides superior surface quality and process security.

Outer layer TiN coating



Cross sectional micrograph

Cross sectional diagram

#### For high surface quality

Built-up edge resistant TiCN coating improves surface finish quality.

#### For extremely long tool life

Wear-resistant columnar-structured TiCN coating ensures long tool life.

#### For superior process security

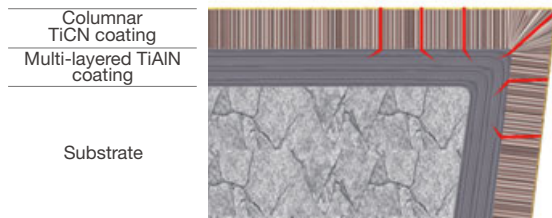
Chipping-resistant multi-layered TiAlN coating provides process security.

### Superior process security

Chipping-resistant multi-layered TiAlN coating provides process security.

## SH7025

Generations of microcracks

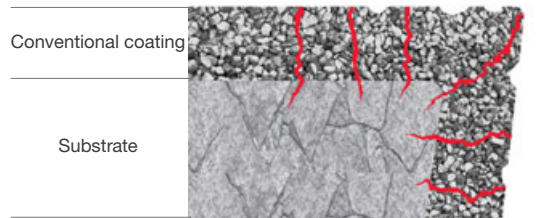


TiAlN coating prevents cracks from further propagation

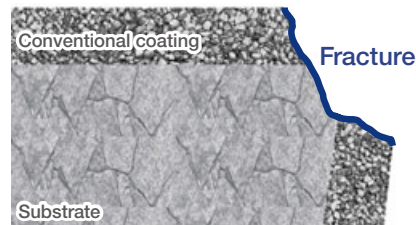


Conventional

Generations of microcracks



Crack reaches the substrate causing catastrophic failure





## CUTTING PERFORMANCE

### Chip control



FACE<sup>INI</sup>CUT

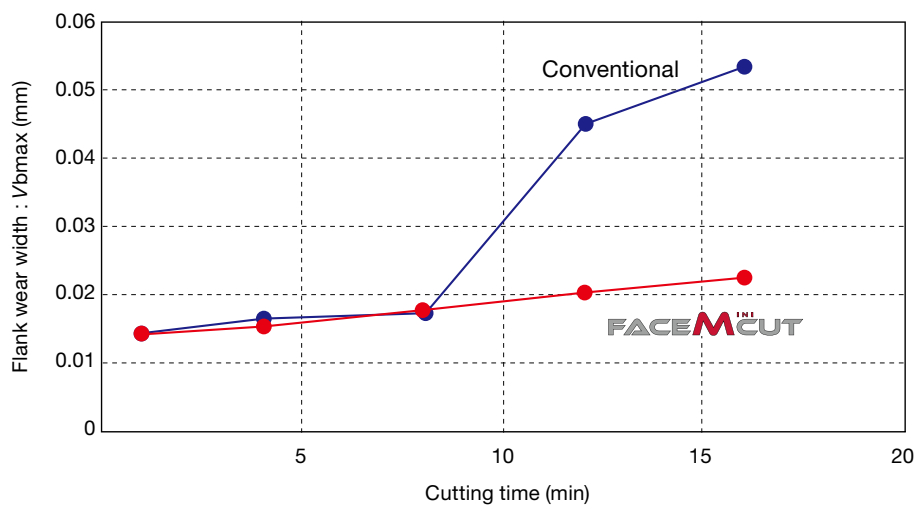


Conventional (Solid bar)

**M** SUS316L / X2CrNiMo17-12-2

Toolholder : A12G-MFR10-D100  
 Insert : MFGR10-200-020 SH7025  
 Cutting speed :  $V_c = 60$  m/min  
 Feed :  $f = 0.02$  mm/rev  
 Depth of cut :  $CW = 2$  mm  
 Groove depth : 9 mm  
 Machining : Face grooving  
 Coolant : Wet (Internal)

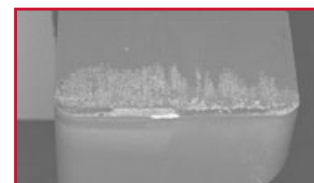
### Corner flank wear



Built-up edge formed 10 minutes after starting the machining process.



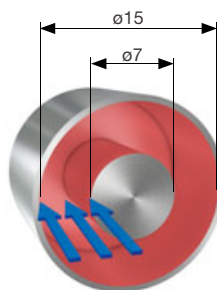
Conventional



SH7025

**M** SUS316L / X2CrNiMo17-12-2

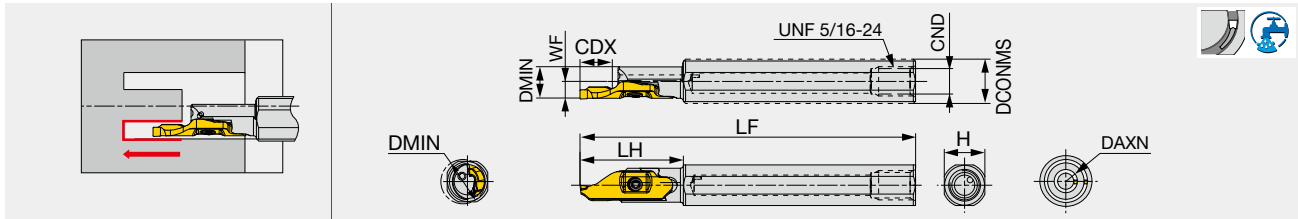
Toolholder : A12G-MFR10-D100  
 Insert : MFGR10-200-020 SH7025  
 Cutting speed :  $V_c = 60$  m/min  
 Feed :  $f = 0.02$  mm/rev  
 Depth of cut :  $CW = 2$  mm  
 Groove depth : 9 mm  
 Application : Face grooving to expand the groove from  $\phi 15$  mm down to  $\phi 7$  mm.  
 Coolant : Wet (Internal)



## TOOLHOLDERS

### A-MFR10

Face grooving toolholder with round shank



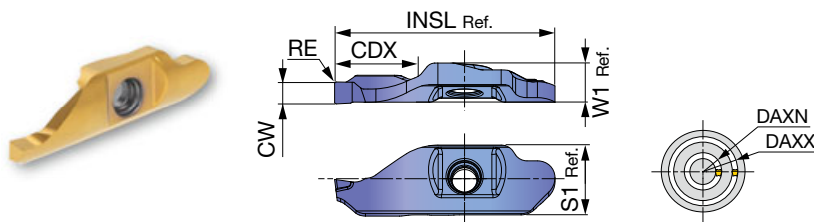
Designation	CDX	DAXN	DCONMS	DMIN	WF	LH	LF	CND	H	Insert	Torque*
A12G-MFR10-D100	9	10	12	10	5	27	90	6.9	11	MFGR10...	1.2
A127G-MFR10-D100	9	10	12.7	10	5	27	90	6.9	11.7	MFGR10...	1.2
A159F-MFR10-D100	9	10	15.875	10	5	27	85	6.9	15	MFGR10...	1.2
A16F-MFR10-D100	9	10	16	10	5	27	85	6.9	15	MFGR10...	1.2

#### SPARE PARTS

Designation	Clamping screw	Wrench
A***-MFR10...	CSTB-2.5	T-8F

## INSERTS

### MFGR10



<b>P</b> Steel	★								
<b>M</b> Stainless	★								
<b>K</b> Cast iron									
<b>N</b> Non-ferrous									
<b>S</b> Superalloys									
<b>H</b> Hard materials									

★ : First choice

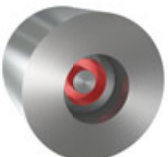

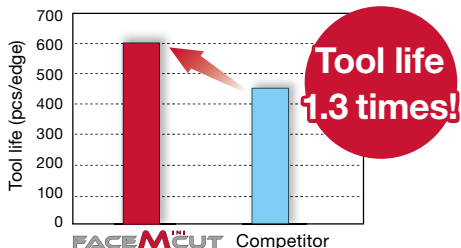
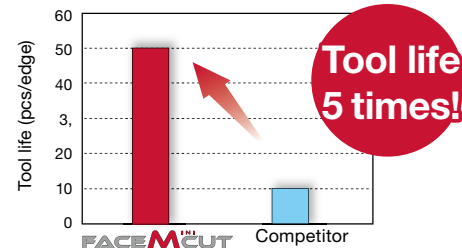
Designation	CW±0.025	RE	Coated					CDX	DAXN	DAXX	INSL	W1	S1
			SH7025										
MFGR10-200-020	2	0.2	●					9	10	-	25	4.6	7.9
MFGR10-200-100	2	1	●					9	10	-	25	4.6	7.9
MFGR10-250-020	2.5	0.2	●					9	10	16	25	4.6	7.9
MFGR10-250-125	2.5	1.25	●					9	10	-	25	4.6	7.9

● : New

## STANDARD CUTTING CONDITIONS

ISO	Workpiece material	Grade	Cutting speed Vc (m/min)	Feed: f (mm/rev)
<b>P</b>	Low carbon steel S15C, etc., C15E4, etc.	SH7025	30 - 120	0.01 - 0.07
	Carbon steels, Alloy steel S55C, SCM440, etc., C55, 42CrMoS4, etc.	SH7025	30 - 120	0.01 - 0.07
	Prehardened steel NAK80, PX5, etc.	SH7025	30 - 120	0.01 - 0.07
<b>M</b>	Stainless steel SUS304, etc., X5CrNi18-9, etc.	SH7025	30 - 120	0.01 - 0.07

## PRACTICAL EXAMPLES

Workpiece type		Guide for linear motion bearing	Spool pin
Toolholder		A12G-MFR10-D100	A12G-MFR10-D100
Insert		MFGR10-200-020	MFGR10-200-020
Grade		SH7025	SH7025
Workpiece material		SUS316 / X5CrNiMo17-12-2	SCM415
		 <b>M</b>	 <b>P</b>
Cutting conditions	Cutting speed: $V_c$ (m/min)	75	50
	Feed : $f$ (mm/rev)	0.03	0.02
	Groove width : CW (mm)	2	2
	Groove depth : CDX (mm)	5	2.5
	Machining	Deep face grooving	Deep face grooving
Coolant		Wet	Wet
Results		 <p>FACEMiniCut eliminated bird nesting of chips and chatter, which were the case with solid carbide boring bars. As the result, 1.3 times tool life increase was achieved.</p>	 <p>FACEMiniCut eliminated bird nesting of chips and allowed continuous machining without stopping the machine for manual chip removal. As the result, 5 times tool life increase was achieved.</p>



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