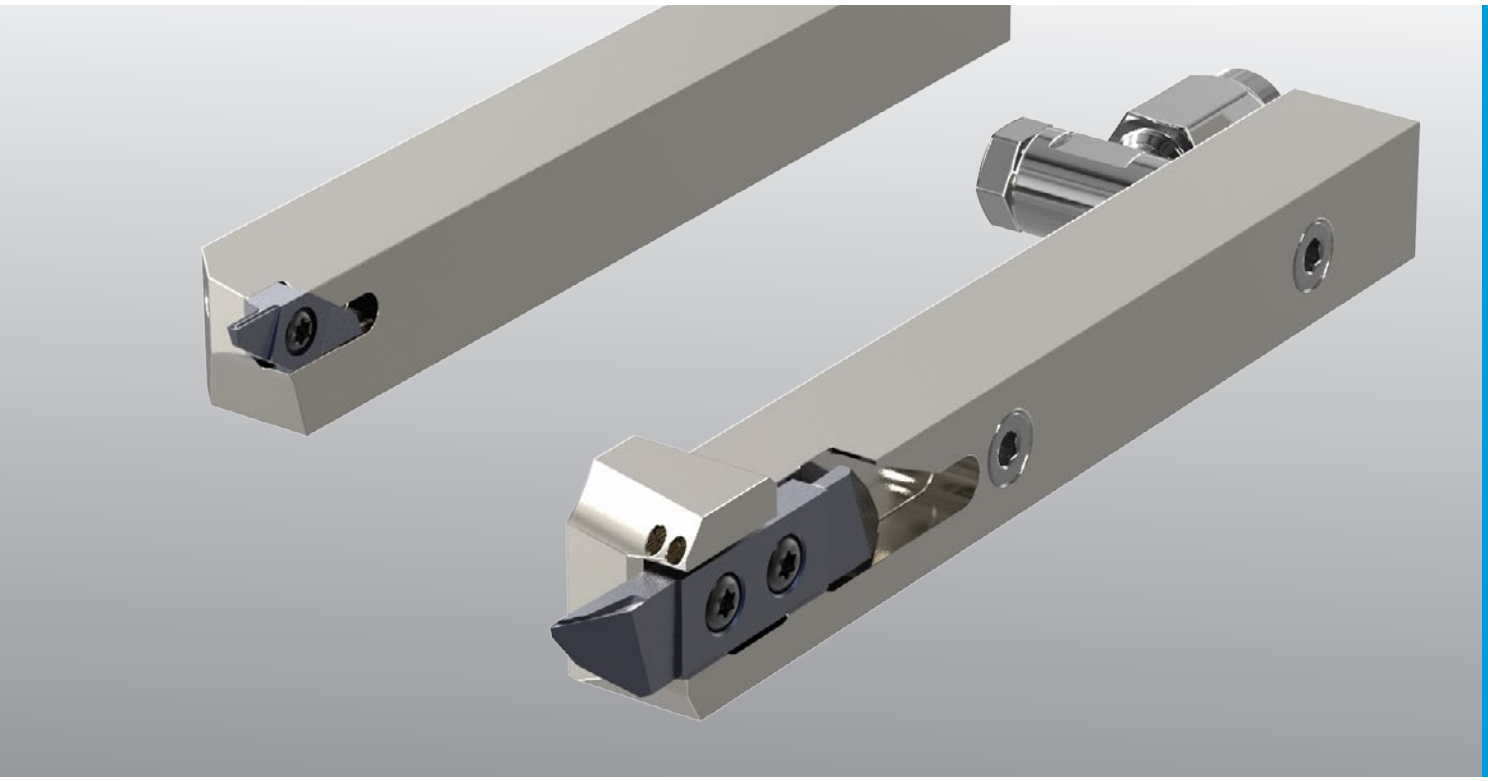
UTILIS multidec®
swiss type tools

multidec®-CUT

G-LINE INSERTS

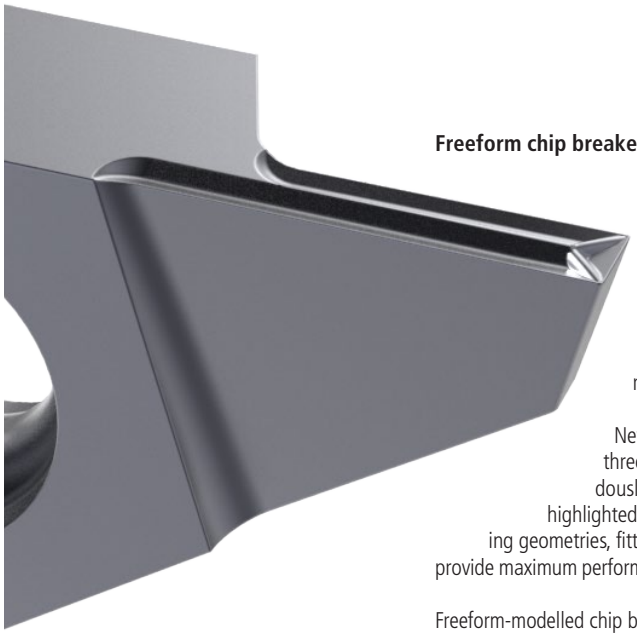


INNOVATION

THE PERFORMANCE BOOST IN THE CUTTING AREA!

future since 1915

UTILIS®
Tooling for High Technology



Freeform chip breakers for small part manufacturing and micro cutting

Lack of chip breaking and insufficient chip removal are major challenges during metal-cutting machining. The focus is also on high productivity, process reliability and the longest possible tool life.

Perfect chip control is therefore a central issue in all modern production. These requirements are often difficult to fulfil with ground chip breakers.

New manufacturing technologies which are ideally suitable for generating any three-dimensional shapes have increased the degree of design freedom tremendously in comparison to grinding technology. The new G-LINE at multidec® has highlighted the use of this new freeform design technology. Well thought-out chip breaking geometries, fitted to the well-tried inserts of the multidec®-CUT 1600 and -CUT 3000 series, provide maximum performance.

Freeform-modelled chip breakers achieve significant improvements in a wide range of materials in comparison to ground ones. This advantage is particularly evident with materials which are difficult to machine such as super-alloys.

As well as significantly improved chip control, cutting values that are up to 30 % higher and a tool life that is up to 50 % longer can be achieved using the G-LINE inserts in comparison to ground chip breakers.

Advantages:
– improved chip control
– better cutting values
– longer tool life
– smaller chip volume
– better process reliability
– wear-resistant and tough carbide substrate with two heavy-duty coatings
– sharp and rounded cutting edges
– can be used on all multidec®-CUT 1600 and multidec®-CUT 3000 holders

Overview – multidec®-CUT, G-LINE inserts

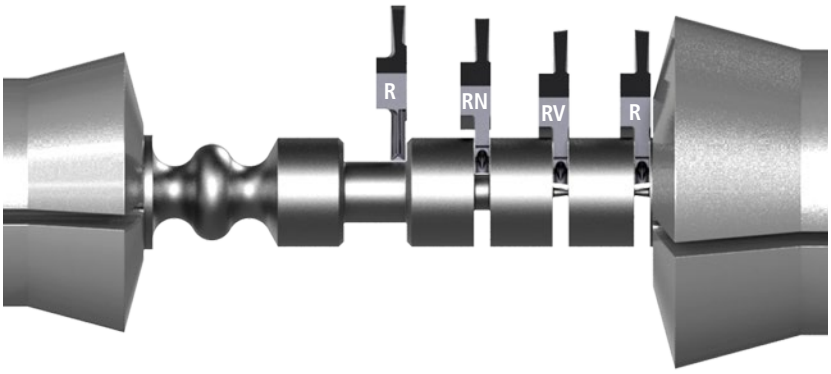
UTILIS multidec® swiss type tools

multidec®-CUT 1600

CUT off

Grooving and Turning

1605… 1602…



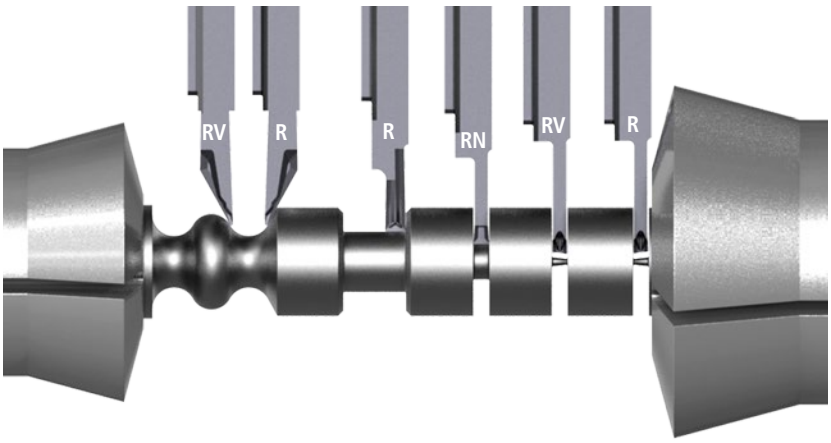
multidec®-CUT 3000

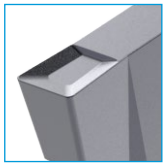
CUT off

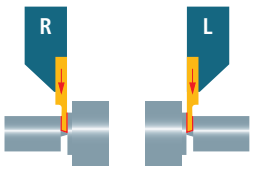
Grooving and Turning

Copy turning (back)

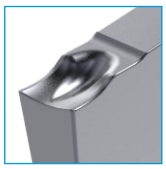
3004… 3005… 3002…

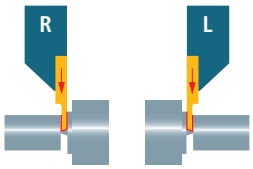




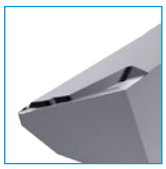


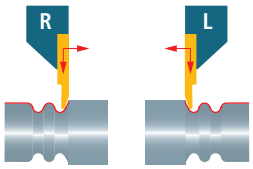
Cutting off with the GS12 chip breaker
The "GS12" geometry combines the advantages of the well-tried chip breaker of the "GS" product line with the accuracy of a ground parting-off insert. The sharp cutting edge provides excellent cutting ability. This makes it the number one choice in a wide range of applications in which a soft cut and good chip control are required, also with lower feed rates.



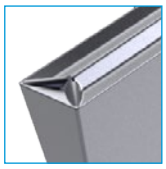


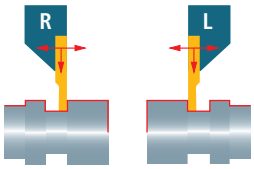
Cutting off with the GT20 chip breaker
The "GT20" geometry is another parting-off geometry which is available with a sharp and a slightly rounded cutting edge in comparison to the "GS12". The special design of this chip breaker guarantees excellent chip flow, short chips and generates smooth surfaces on the workpiece, even with higher feed rates.





Copy turning (rear) with chip breaker GB20
The "GB20" geometry provides optimum and process-reliable chip formation with both low and higher cutting depths and feed rates with an extremely sharp cutting edge in combination with multi-stage chip breakers.



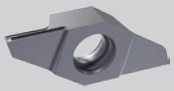


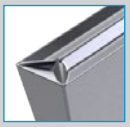
Grooving and turning with chip breaker GC20
The "GC20" geometry was tailored for facing, grooving and turning operations. Turning in three directions with extremely low and high cutting depths and feed rates requires a very sophisticated chip breaker in order to achieve optimum chip control.
This geometry provides a good solution in almost any material. This geometry even achieves excellent results in lead-free brass, a material with which chip control is difficult.

Operation grooving and turning with the "GC20" chip breaker
In a comparison between the new G-LINE "GC20" chip breaker and a ground chip breaker which has been established for a long time, perfect rolled chips and an extremely neat finish were achieved on the workpiece with consistent cutting data. The tool life was increased by 200 %, from 3000 to 9000 parts.

CHIP REMOVAL COMPARISON

Machine model	**Star SR 10 type C**
Material number	**1.4435**
Material specification	**X2CrNiMo 18-14-3 (316 L)**
Bar diameter (mm)	**4**
Operation	Grooving and turning
Cooling	Oil





1605… F. GC20

CURRENT

Insert designation	Ground grooving and turning insert	Make	**Competitor**

Cutting speed (Vc)	**75**	m/min
Cutting depth (ap)	1.00	mm
Feed rate (f)	**0.01**	mm/rev
Number of workpieces	**3000**	

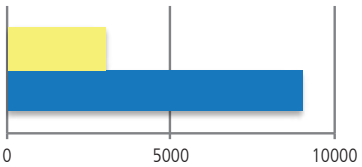
UTILIS (multidec-CUT, G-LINE)

Insert designation	1605-1.0-1.5 FL GC20 R05 UHM20 HPX	Make	**UTILIS**

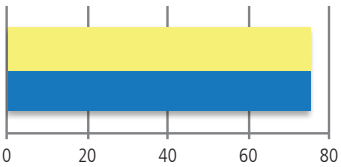
Cutting speed (Vc)	**75**	m/min
Cutting depth (ap)	1.00	mm
Feed rate (f)	**0.01**	mm/rev
Number of workpieces	**9000**	

SUMMARY

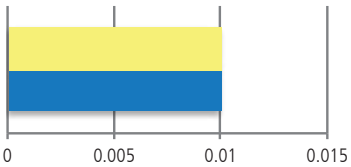
Number of workpieces



Cutting speed (Vc) (m/min)



Feed rate (f) (mm/rev)



Operation cutting off with chip breaker "GS12"
Here a comparison was made between the "GS12" chip breaker and a competitor chip breaker which had already been successfully used in this material. Because of the better chip flow and short chips, it was possible to increase the tool life considerably with the new G-LINE insert with higher cutting values.

CHIP REMOVAL COMPARISON

Machine model	**Citizen M 32**
Material number	**1.4104**
Material specification	**X12CrMoS17 (SUS430F)**
Bar diameter (mm)	**16**
Operation	CUT off
Cooling	Oil

3002... F.N GS12

CURRENT

Insert designation: Sintered CUT off insert — Make: **Competitor**

Cutting speed (Vc)	**85**	m/min
Cutting depth (ap)	**8.00**	mm
Feed rate (f)	**0.03**	mm/rev
Number of workpieces	**310**	

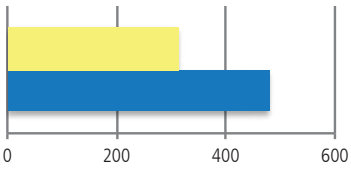
UTILIS (multidec-CUT, G-LINE)

Insert designation: 3002-2-10 FLN GS12 UHM20 TX+ — Make: **UTILIS**

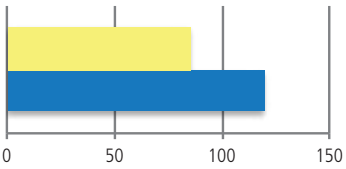
Cutting speed (Vc)	**120**	m/min
Cutting depth (ap)	8.00	mm
Feed rate (f)	**0.05**	mm/rev
Number of workpieces	**480**	

SUMMARY

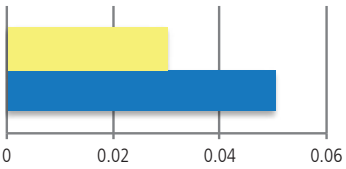
Number of workpieces



Cutting speed (Vc) (m/min)

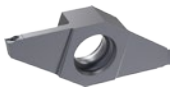


Feed rate (f) (mm/rev)

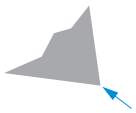


UTILIS multidec swiss type tools

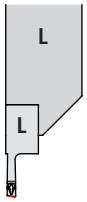
CUT off
"GT20" chip breaker

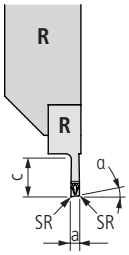


1602… F. GT20



F: Insert with sharp cutting edge



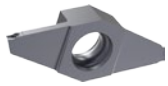


Order designation		Carbide ***						Dimensions							Holder ***
L	R	UHM 10	UHM 10 HX	UHM 10 TX+	UHM 20	UHM 20 HPX	UHM 20 TX+	a	c	α		SR*			
PREMIUM-LINE															
1602-0.8-5 FL GT20 …	1602-0.8-5 FR GT20 …				■	■	■	0.8	5	7°		0.05			1600…
1602-1.0-5 FL GT20 …	1602-1.0-5 FR GT20 …				■	■	■	1	5	7°		0.05			1600…
1602-1.5-5 FL GT20 …	1602-1.5-5 FR GT20 …				■	■	■	1.5	5	7°		0.05			1600…

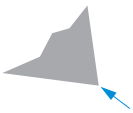
* SR: Protection radius

G-LINE cutting specification 22–23

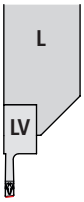
CUT off (offset)
"GT20" chip breaker



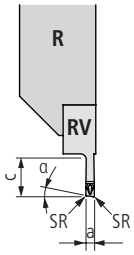
1602… F.V GT20



F: Insert with sharp cutting edge



V: offset



Order designation		Carbide ***						Dimensions							Holder ***
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		–	●	●	○	●	●								
		○	●	●	○	●	●								
		●	○	–	●	○	–								
		–	–	●	–	–	–								
L	R	UHM 10	UHM 10 HX	UHM 10 TX+	UHM 20	UHM 20 HPX	UHM 20 TX+	a	c	α		SR*			
PREMIUM-LINE															
1602-0.8-5 FLV GT20 …	1602-0.8-5 FRV GT20 …				◘	■	■	0.8	5	7°		0.05			1600…
1602-1.0-5 FLV GT20 …	1602-1.0-5 FRV GT20 …				◘	■	■	1	5	7°		0.05			1600…
1602-1.5-5 FLV GT20 …	1602-1.5-5 FRV GT20 …				◘	■	■	1.5	5	7°		0.05			1600…

* SR: Protection radius

G-LINE cutting specification 22–23

Item 300362

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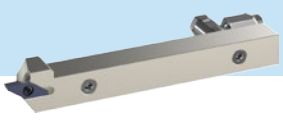
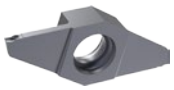
***** Can be found in general catalogue 2020/21**

– Legend 8–9
– Technical information 11–31
– Holder multidec®-CUT 1600 80–94

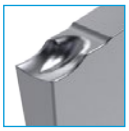


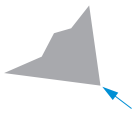
UTILIS multidec swiss type tools

CUT off (neutral)
"GT20" chip breaker

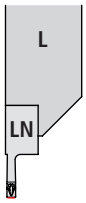


1602… F.N GT20

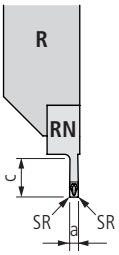




F: Insert with sharp cutting edge



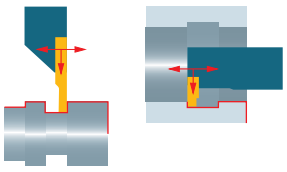
N: neutral



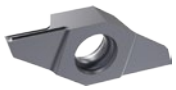
Order designation		Carbide ***						Dimensions							Holder ***
L	R	UHM 10	UHM 10 HX	UHM 10 TX+	UHM 20	UHM 20 HPX	UHM 20 TX+	a	c			SR*			
PREMIUM-LINE															
1602-0.8-5 FLN GT20 …	1602-0.8-5 FRN GT20 …				■	■	■	0.8	5			0.05			1600…
1602-1.0-5 FLN GT20 …	1602-1.0-5 FRN GT20 …				■	■	■	1	5			0.05			1600…
1602-1.5-5 FLN GT20 …	1602-1.5-5 FRN GT20 …				■	■	■	1.5	5			0.05			1600…

* SR: Protection radius

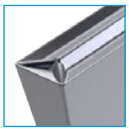
G-LINE cutting specification 22–23

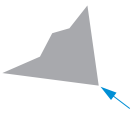


Grooving and turning
"GC20" chip breaker

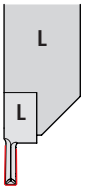


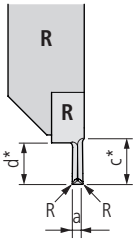
1605… F. GC20





F: Insert with sharp cutting edge





Order designation		Carbide ***						Dimensions							Holder ***
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		–	●	●	○	●	●								
		○	●	●	○	●	●								
		●	○	–	●	○	–								
		–	–	●	–	–	–								
L	R	UHM 10	UHM 10 HX	UHM 10 TX+	UHM 20	UHM 20 HPX	UHM 20 TX+	a	c*	d*		R			
PREMIUM-LINE															
1605-0.8-1.5 FL GC20 ZZ …	1605-0.8-1.5 FR GC20 ZZ …				□	■	■	0.8	1.5	1.5		–			1600…
1605-0.8-1.5 FL GC20 R02 …	1605-0.8-1.5 FR GC20 R02 …				□	■	■	0.8	1.5	1.5		0.02			1600…
1605-0.8-1.5 FL GC20 R05 …	1605-0.8-1.5 FR GC20 R05 …				□	■	■	0.8	1.5	1.5		0.05			1600…
1605-1.0-1.5 FL GC20 ZZ …	1605-1.0-1.5 FR GC20 ZZ …				□	■	■	1	1.5	1.5		–			1600…
1605-1.0-1.5 FL GC20 R02 …	1605-1.0-1.5 FR GC20 R02 …				□	■	■	1	1.5	1.5		0.02			1600…
1605-1.0-1.5 FL GC20 R05 …	1605-1.0-1.5 FR GC20 R05 …				□	■	■	1	1.5	1.5		0.05			1600…
1605-1.0-3.5 FL GC20 R05 …	1605-1.0-3.5 FR GC20 R05 …				□	■	■	1	5	3.5		0.05			1600…
1605-1.5-4.5 FL GC20 R05 …	1605-1.5-4.5 FR GC20 R05 …				□	■	■	1.5	5	4.5		0.05			1600…
1605-2.0-5.0 FL GC20 R05 …	1605-2.0-5.0 FR GC20 R05 …				□	■	■	2	5	5		0.05			1600…

* c: maximal turning capacity
d: maximal grooving capacity

G-LINE cutting specification 22–23

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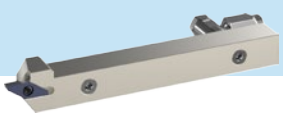
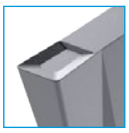
– Legend 8–9
– Technical information 11–31
– Holder multidec®-CUT 1600 80–94

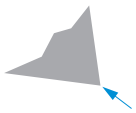


UTILIS multidec swiss type tools

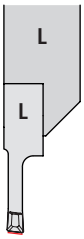
CUT off
"GS12" chip breaker

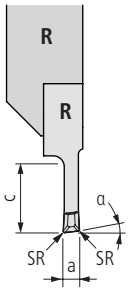


3002… F. GS12



F: Insert with sharp cutting edge





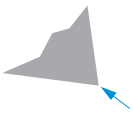
Order designation		Carbide ***						Dimensions							Holder ***
L	R	UHM 10	UHM 10 HX	UHM 10 TX+	UHM 20	UHM 20 HPX	UHM 20 TX+	a	c	α		SR*			
PREMIUM-LINE															
3002-1.5-10 FL GS12 …	3002-1.5-10 FR GS12 …					■	■	1.5	10	7°		0.15			3000…
3002-1.5-16 FL GS12 …	3002-1.5-16 FR GS12 …					■	■	1.5	16	7°		0.15			3000…
3002-2.0-10 FL GS12 …	3002-2.0-10 FR GS12 …					■	■	2	10	7°		0.2			3000…
3002-2.0-16 FL GS12 …	3002-2.0-16 FR GS12 …					■	■	2	16	7°		0.2			3000…
3002-2.5-13 FL GS12 …	3002-2.5-13 FR GS12 …					■	■	2.5	13	7°		0.2			3000…
3002-2.5-16 FL GS12 …	3002-2.5-16 FR GS12 …					■	■	2.5	16	7°		0.2			3000…
3002-3.0-16 FL GS12 …	3002-3.0-16 FR GS12 …					■	■	3	16	7°		0.2			3000…

* SR: Protection radius

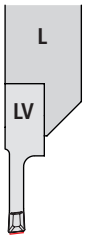
G-LINE cutting specification 22–23

CUT off (offset)
"GS12" chip breaker

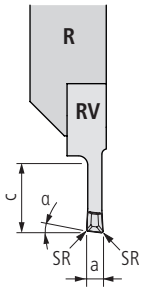
3002… F.V GS12



F: Insert with sharp cutting edge



V: offset



Order designation		Carbide ***						Dimensions							Holder ***
		–	–	●	○	●	●								
		–	●	●	○	●	●								
		○	●	●	○	●	●								
		●	○	–	●	○	–								
		–	–	●	–	–	–								
L	R	UHM 10	UHM 10 HX	UHM 10 TX+	UHM 20	UHM 20 HPX	UHM 20 TX+	a	c	α		SR*			
PREMIUM-LINE															
3002-1.5-10 FLV GS12 …	3002-1.5-10 FRV GS12 …					■	■	1.5	10	7°		0.15			3000…
3002-1.5-16 FLV GS12 …	3002-1.5-16 FRV GS12 …					■	■	1.5	16	7°		0.15			3000…
3002-2.0-10 FLV GS12 …	3002-2.0-10 FRV GS12 …					■	■	2	10	7°		0.2			3000…
3002-2.0-16 FLV GS12 …	3002-2.0-16 FRV GS12 …					■	■	2	16	7°		0.2			3000…
3002-2.5-13 FLV GS12 …	3002-2.5-13 FRV GS12 …					■	■	2.5	13	7°		0.2			3000…
3002-2.5-16 FLV GS12 …	3002-2.5-16 FRV GS12 …					■	■	2.5	16	7°		0.2			3000…
3002-3.0-16 FLV GS12 …	3002-3.0-16 FRV GS12 …					■	■	3	16	7°		0.2			3000…

* SR: Protection radius

G-LINE cutting specification 22–23

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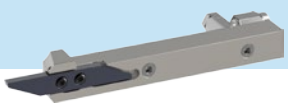
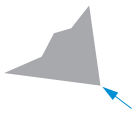
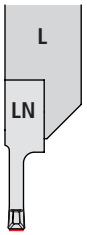


CUT off (neutral)
"GS12" chip breaker

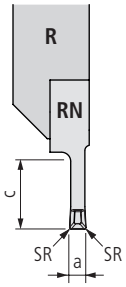
3002… F.N GS12



F: Insert with sharp cutting edge



N: neutral

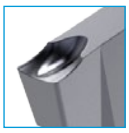


Order designation		Carbide ***						Dimensions							Holder ***
L	R	UHM 10	UHM 10 HX	UHM 10 TX+	UHM 20	UHM 20 HPX	UHM 20 TX+	a	c			SR*			
PREMIUM-LINE															
3002-1.0-10 FLN GS12 …	3002-1.0-10 FRN GS12 …					■	■	1	10			0.05			3000…
3002-1.0-16 FLN GS12 …	3002-1.0-16 FRN GS12 …					■	■	1	16			0.05			3000…
3002-1.5-10 FLN GS12 …	3002-1.5-10 FRN GS12 …					■	■	1.5	10			0.15			3000…
3002-1.5-16 FLN GS12 …	3002-1.5-16 FRN GS12 …					■	■	1.5	16			0.15			3000…
3002-2.0-10 FLN GS12 …	3002-2.0-10 FRN GS12 …					■	■	2	10			0.2			3000…
3002-2.0-16 FLN GS12 …	3002-2.0-16 FRN GS12 …					■	■	2	16			0.2			3000…
3002-2.5-13 FLN GS12 …	3002-2.5-13 FRN GS12 …					■	■	2.5	13			0.2			3000…
3002-2.5-16 FLN GS12 …	3002-2.5-16 FRN GS12 …					■	■	2.5	16			0.2			3000…
3002-3.0-16 FLN GS12 …	3002-3.0-16 FRN GS12 …					■	■	3	16			0.2			3000…

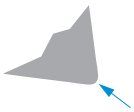
* SR: Protection radius

G-LINE cutting specification 22–23

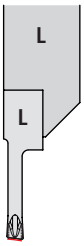
CUT off
"GT20" chip breaker

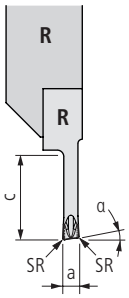


3002… E. GT20



E: Insert with rounded cutting edge





Order designation		Carbide ***						Dimensions							Holder ***
		–	–	●	○	●	●								
		–	●	●	○	●	●								
		○	●	●	○	●	●								
		●	○	–	●	○	–								
		–	–	●	–	–	–								
L	R	UHM 10	UHM 10 HX	UHM 10 TX+	UHM 20	UHM 20 HPX	UHM 20 TX+	a	c	α		SR*			
PREMIUM-LINE															
3002-1.5-10 EL GT20 …	3002-1.5-10 ER GT20 …					■	■	1.5	10	7°		0.15			3000…
3002-2.0-16 EL GT20 …	3002-2.0-16 ER GT20 …					■	■	2	16	7°		0.2			3000…

* SR: Protection radius

G-LINE cutting specification 22–23

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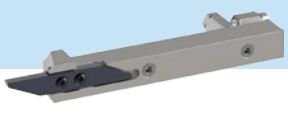
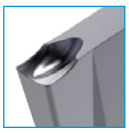
– Legend 8–9
– Technical information 11–31
– Holder multidec®-CUT 1600 150–158

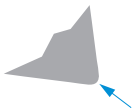


UTILIS multidec swiss type tools

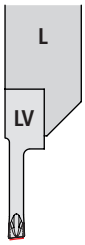
CUT off (offset)
"GT20" chip breaker



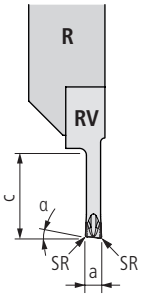
3002… F.V GT20



E: Insert with rounded cutting edge



V: offset



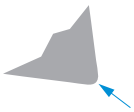
Order designation		Carbide ***						Dimensions							Holder ***
L	R	UHM 10	UHM 10 HX	UHM 10 TX+	UHM 20	UHM 20 HPX	UHM 20 TX+	a	c	α		SR*			
PREMIUM-LINE															
3002-1.5-10 ELV GT20 …	3002-1.5-10 ERV GT20 …					■	■	1.5	10	7°		0.15			3000…
3002-2.0-16 ELV GT20 …	3002-2.0-16 ERV GT20 …					■	■	2	16	7°		0.2			3000…

* SR: Protection radius

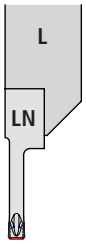
G-LINE cutting specification 22–23

CUT off (neutral)
"GT20" chip breaker

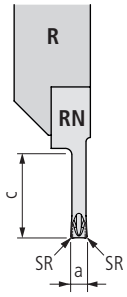
3002… E.N GT20



E: Insert with rounded cutting edge



N: neutral



Order designation		Carbide ***						Dimensions							Holder ***
		–	–	●	○	●	●								
		–	●	●	○	●	●								
		○	●	●	○	●	●								
		●	○	–	●	○	–								
		–	–	●	–	–	–								
L	R	UHM 10	UHM 10 HX	UHM 10 TX+	UHM 20	UHM 20 HPX	UHM 20 TX+	a	c			SR*			
PREMIUM-LINE															
3002-1.0-10 ELN GT20 …	3002-1.0-10 ERN GT20 …					■	■	1	10			0.05			3000…
3002-1.0-16 ELN GT20 …	3002-1.0-16 ERN GT20 …					■	■	1	16			0.05			3000…
3002-1.5-10 ELN GT20 …	3002-1.5-10 ERN GT20 …					■	■	1.5	10			0.15			3000…
3002-2.0-16 ELN GT20 …	3002-2.0-16 ERN GT20 …					■	■	2	16			0.2			3000…

* SR: Protection radius

G-LINE cutting specification 22–23

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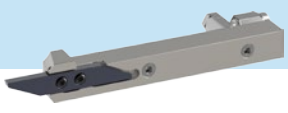
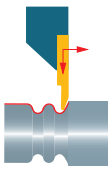
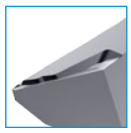
***** Can be found in general catalogue 2020/21**

– Legend 8–9
– Technical information 11–31
– Holder multidec®-CUT 1600 150–158

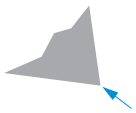




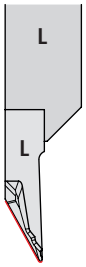
Copy turning (back)
"GB20" chip breaker

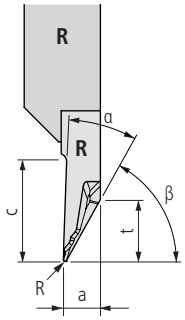


3004… F. GB20



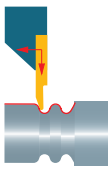
F: Insert with sharp cutting edge





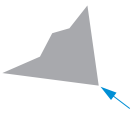
Order designation		Carbide ***						Dimensions							Holder ***
L	R	UHM 10	UHM 10 HX	UHM 10 TX+	UHM 20	UHM 20 HPX	UHM 20 TX+	a	c	α	β	R	t		
PREMIUM-LINE															
3004-3.2-6 FL 29015 GB20 …	3004-3.2-6 FR 29015 GB20 …					■	■	3.2	11	29°	59°	0.15	5.3		3000…
3004-3.2-6 FL 29035 GB20 …	3004-3.2-6 FR 29035 GB20 …					■	■	3.2	11	29°	59°	0.35	4.7		3000…

G-LINE cutting specification 22–23

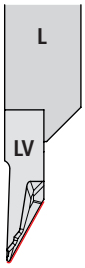


Copy turning (back, offset)
"GB20" chip breaker

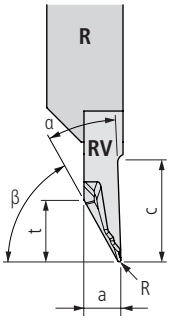
3004… F.V GB20



F: Insert with sharp cutting edge



V: offset



Order designation		Carbide ***						Dimensions							Holder ***
		–	–	●	○	●	●								
		–	●	●	○	●	●								
		○	●	●	○	●	●								
		●	○	–	●	○	–								
		–	–	●	–	–	–								
L	R	UHM 10	UHM 10 HX	UHM 10 TX+	UHM 20	UHM 20 HPX	UHM 20 TX+	a	c	α	β	R	t		
PREMIUM-LINE															
3004-3.2-6 FLV 29015 GB20 …	3004-3.2-6 FRV 29015 GB20 …					■	■	3.2	11	29°	59°	0.15	5.3		3000…
3004-3.2-6 FLV 29035 GB20 …	3004-3.2-6 FRV 29035 GB20 …					■	■	3.2	11	29°	59°	0.35	4.7		3000…

G-LINE cutting specification 22–23

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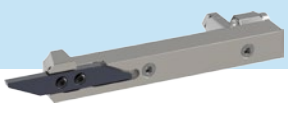
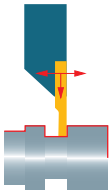
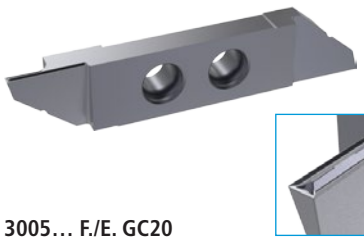
***** Can be found in general catalogue 2020/21**

– Legend 8–9
– Technical information 11–31
– Holder multidec®-CUT 1600 150–158

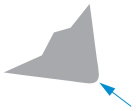




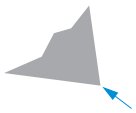
Grooving and turning "GC20" chip breaker



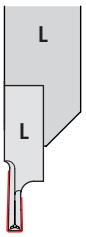
3005… F./E. GC20

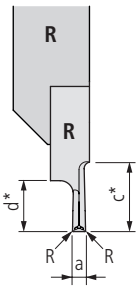


E: Insert with rounded cutting edge



F: Insert with sharp cutting edge





Order designation		Carbide ***						Dimensions							Holder ***
L	R	UHM 10	UHM 10 HX	UHM 10 TX+	UHM 20	UHM 20 HPX	UHM 20 TX+	a	c*	d*		R			
PREMIUM-LINE															
3005-1.0-8 FL GC20 ZZ …	3005-1.0-8 FR GC20 ZZ …					■	■	1	8	3.5		–			3000…
3005-1.0-8 FL GC20 R02 …	3005-1.0-8 FR GC20 R02 …					■	■	1	8	3.5		0.02			3000…
3005-1.0-8 FL GC20 R05 …	3005-1.0-8 FR GC20 R05 …					■	■	1	8	3.5		0.05			3000…
3005-1.5-8 FL GC20 ZZ …	3005-1.5-8 FR GC20 ZZ …					■	■	1.5	8	4		–			3000…
3005-1.5-8 FL GC20 R02 …	3005-1.5-8 FR GC20 R02 …					■	■	1.5	8	4		0.02			3000…
3005-1.5-8 FL GC20 R05 …	3005-1.5-8 FR GC20 R05 …					■	■	1.5	8	4		0.05			3000…
3005-2.0-8 EL GC20 R05 …	3005-2.0-8 ER GC20 R05 …					■	■	2	8	5		0.05			3000…
3005-2.0-8 EL GC20 R15 …	3005-2.0-8 ER GC20 R15 …					■	■	2	8	5		0.15			3000…

* c: maximal turning capacity
d: maximal grooving capacity

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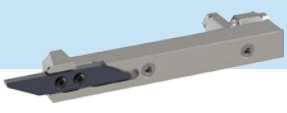
***** Can be found in general catalogue 2020 / 21**

– Legend 8–9
– Technical information 11–31
– Holder multidec®-CUT 1600 150–158



CUT off*

Materials (category) Hardness value (HB) / (HRC)	Carbide	Cutting speeds v_c (m/min)	Feeds f (mm/rev)
		▼	▼
Steel non-alloyed (I) 125–300 HB	UHM 20	40–120	0.03–0.1
	UHM 20 HPX	60–160	0.03–0.1
	UHM 20 TX+	60–180	0.03–0.1
Steel low alloyed (II) 180–250 HB	UHM 20	40–110	0.03–0.1
	UHM 20 HPX	60–170	0.03–0.1
	UHM 20 TX+	60–160	0.03–0.1
Steel high alloyed (III) 200–350 HB	UHM 20	40–110	0.01–0.1
	UHM 20 HPX	60–150	0.01–0.1
	UHM 20 TX+	60–140	0.01–0.1
Stainless steel (V) 180–220 HB	UHM 20	40–100	0.01–0.1
	UHM 20 HPX	80–150	0.01–0.1
	UHM 20 TX+	70–140	0.01–0.1
Stainless steel (VI) 220–330 HB	UHM 20	30–70	0.005–0.03
	UHM 20 HPX	70–90	0.005–0.03
	UHM 20 TX+	60–80	0.005–0.03
Titanium (IV) –	UHM 20	40–60	0.01–0.07
	UHM 20 HPX	50–80	0.02–0.07
	UHM 20 TX+	50–70	0.02–0.08
Aluminum (VII) 60–130 HB	UHM 20	100–1500	0.08–0.3
	UHM 20 HPX	110–1650	0.1–0.3
	UHM 20 TX+	–	0.1–0.3
Brass / lead-free brass (VIII) –	UHM 20	80–200	0.08–0.3
	UHM 20 HPX	88–220	0.1–0.3
	UHM 20 TX+	90–200	0.1–0.3
Synthetics reinforced/composits (IX) –	UHM 20	–	–
	UHM 20 HPX	–	–
	UHM 20 TX+	–	–
Hard materials (X) 45–70 HRC	UHM 20	–	–
	UHM 20 HPX	–	–
	UHM 20 TX+	–	–

* Reduce the feed rate by 30 % when feeding in until the insert fully engages and when moving out the final 0.3 mm.

Note
– In order to achieve good results, oil cooling is recommended, preferably at high pressure, with approx. 60 bar. Too much pressure can have a negative influence on chip formation.
– With stable conditions, the use of holders with integrated cooling "IC" and optimum cooling can generally increase the cutting data by up to 30 %.

Grooving and Turning / copy turning*

Materials (category) Hardness value (HB) / (HRC)	Carbide	Cutting speeds v_c (m/min)			Feeds f (mm/rev)			Depths of cut a_p (mm)		
		▼	▼▼	▼▼▼	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼
Steel non-alloyed (I) 125–300 HB	UHM 20	40–110	60–120	60–140	0.03–0.1	0.03–0.15	0.01–0.15	0.5–4	0.1–2.5	0.05–1.5
	UHM 20 HPX	150–200	180–220	180–220	0.03–0.1	0.03–0.15	0.01–0.15	0.5–4	0.1–2.5	0.05–1.5
	UHM 20 TX+	130–170	160–194	170–210	0.03–0.1	0.03–0.15	0.01–0.15	0.5–4	0.1–2.5	0.05–1.5
Steel low alloyed (II) 180–250 HB	UHM 20	50–110	50–120	44–132	0.03–0.1	0.03–0.15	0.01–0.15	0.5–4	0.1–2.5	0.05–1.5
	UHM 20 HPX	90–170	90–180	176–220	0.03–0.1	0.03–0.15	0.01–0.15	0.5–4	0.1–2.5	0.05–1.5
	UHM 20 TX+	80–150	80–160	176–198	0.03–0.1	0.03–0.15	0.01–0.15	0.5–4	0.1–2.5	0.05–1.5
Steel high alloyed (III) 200–350 HB	UHM 20	40–80	40–80	40–100	0.03–0.1	0.03–0.15	0.01–0.15	0.5–4	0.1–2.5	0.05–1.5
	UHM 20 HPX	60–150	60–160	80–160	0.03–0.1	0.03–0.15	0.01–0.15	0.5–4	0.1–2.5	0.05–1.5
	UHM 20 TX+	60–140	60–150	70–150	0.03–0.1	0.03–0.15	0.01–0.15	0.5–4	0.1–2.5	0.05–1.5
Stainless steel (V) 180–220 HB	UHM 20	40–100	40–110	40–120	0.03–0.1	0.03–0.15	0.01–0.15	0.5–4	0.1–2.5	0.05–1.5
	UHM 20 HPX	80–150	100–180	120–200	0.03–0.1	0.03–0.15	0.01–0.15	0.5–4	0.1–2.5	0.05–1.5
	UHM 20 TX+	70–130	100–160	120–180	0.03–0.1	0.03–0.15	0.01–0.15	0.5–4	0.1–2.5	0.05–1.5
Stainless steel (VI) 220–330 HB	UHM 20	30–70	30–80	30–80	0.02–0.095	0.02–0.014	0.005–0.014	0.5–4	0.1–2.5	0.05–1.5
	UHM 20 HPX	70–90	80–120	80–150	0.02–0.095	0.02–0.014	0.005–0.014	0.5–4	0.1–2.5	0.05–1.5
	UHM 20 TX+	60–80	70–110	70–130	0.02–0.095	0.02–0.014	0.005–0.014	0.5–4	0.1–2.5	0.05–1.5
Titanium (IV) –	UHM 20	40–60	50–70	60–80	0.02–0.095	0.02–0.014	0.005–0.014	0.5–4	0.1–2.5	0.05–1.5
	UHM 20 HPX	50–100	60–120	60–140	0.02–0.095	0.02–0.014	0.005–0.014	0.5–4	0.1–2.5	0.05–1.5
	UHM 20 TX+	40–80	60–120	60–120	0.02–0.095	0.02–0.014	0.005–0.014	0.5–4	0.1–2.5	0.05–1.5
Aluminum (VII) 60–130 HB	UHM 20	100–500	120–500	160–500	0.1–0.3	0.02–0.25	0.005–0.20	0.5–5	0.1–3	0.05–1.5
	UHM 20 HPX	110–170	130–600	170–600	0.1–0.3	0.02–0.25	0.005–0.20	0.5–5	0.1–3	0.05–1.5
	UHM 20 TX+	100–160	130–600	160–600	0.1–0.3	0.02–0.25	0.005–0.20	0.5–5	0.1–3	0.05–1.5
Brass / lead-free brass (VIII) –	UHM 20	80–200	90–200	140–500	0.1–0.3	0.02–0.15	0.005–0.10	0.5–5	0.1–3	0.05–1.5
	UHM 20 HPX	90–220	100–250	130–600	0.1–0.3	0.02–0.15	0.005–0.10	0.5–5	0.1–3	0.05–1.5
	UHM 20 TX+	90–210	100–240	120–600	0.1–0.3	0.02–0.15	0.005–0.10	0.5–5	0.1–3	0.05–1.5
Synthetics reinforced/composits (IX) –	UHM 20	–	–	–	–	–	–	–	–	–
	UHM 20 HPX	–	–	–	–	–	–	–	–	–
	UHM 20 TX+	–	–	–	–	–	–	–	–	–
Hard materials (X) 45–70 HRC	UHM 20	–	–	–	–	–	–	–	–	–
	UHM 20 HPX	–	–	–	–	–	–	–	–	–
	UHM 20 TX+	–	–	–	–	–	–	–	–	–

* With radial infeed, reduce the feed rate by 30–50 %.

Note

– In order to achieve good results, oil cooling is recommended, preferably at high pressure, with approx. 60 bar. Too much pressure can have a negative influence on chip formation.

– With stable conditions, the use of holders with integrated cooling "IC" and optimum cooling can generally increase the cutting data by up to 30 %.

UTILIS, MULTIDEC-CUT, G-LINE INSERTS, INNOVATION 2021.04 EN – 400870

UTILIS®

Tooling for High Technology

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