Cut-Off Solutions for Small Parts Machining

KGZ NEW

Strong, Precise, and Reliable Cut-Off Performance

Provides stable machining and is easy to use with unique clamp design

New coating PR20 series provides longer tool life

Extensive product lineup for a wide variety of applications

New grooving inserts now available NEW

Cut-Off Solutions for Small Parts Machining

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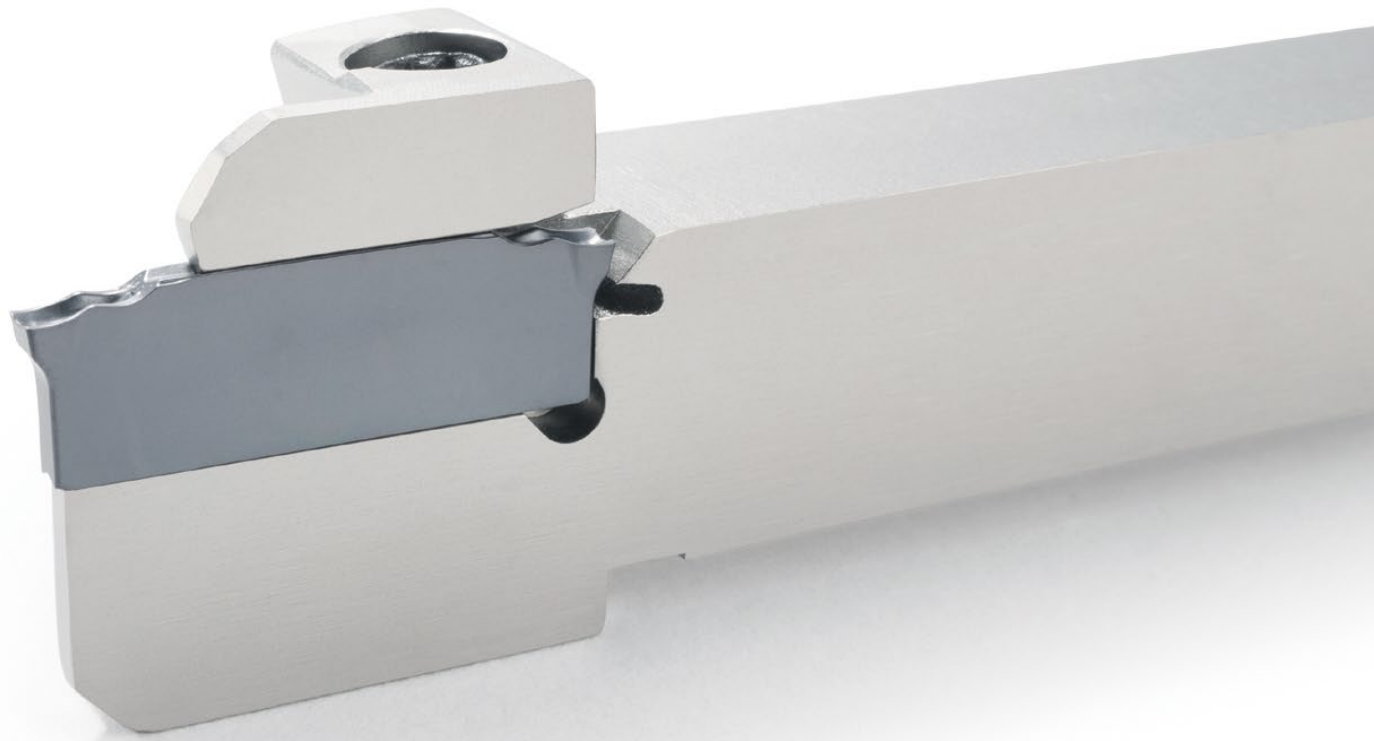
Provides stable machining and is easy to use with unique clamp design
New coating PR20 series provides longer tool life and supports a wide range of applications

Challenge

Cut-off is an important, but difficult process in small parts machining applications

Machining performance	**High machining load and tool rigidity issues** **Chatter / Insert and holder damage / Difficulty improving machining efficiency etc.**
Usability	**Inserts can be difficult to replace inside the machine resulting in time-consuming work and the possibility of insecure clamping**



Newly developed clamp creates a strong and rigid hold

Strength

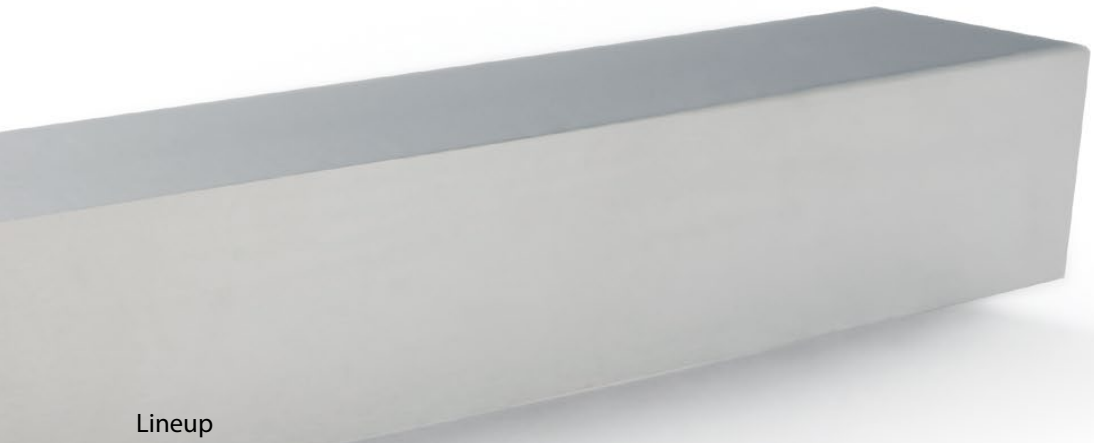
Stable machining with sturdy clamp design

- Greater chatter resistance provides excellent surface finish and stable tool life
- Toolholder durability reduces down-time and cuts cost
- Supports high efficiency machining and reduces cycle time

Dependability

Easy insert management

- Fast and secure insert installation
- Inserts are more resistant to wear and reduce the frequency of tool changes



Lineup

Insert	Cut-off	Low feed **PF**	Medium feed **PM**	High feed **PH**	Low cutting force **PG**				Grades
	Grooving NEW	General purpose **GM**	Low feed **GL**	High feed **PH**	Copying **CM**	Low cutting force **GS**	PCD **NB**		

Grades

PVD coating P M K
PR2015 / PR2025 / PR2035

Cermet P
TN620

DLC coating N
PDL025

Non-coated carbide K N
GW15

PCD N
KPD001

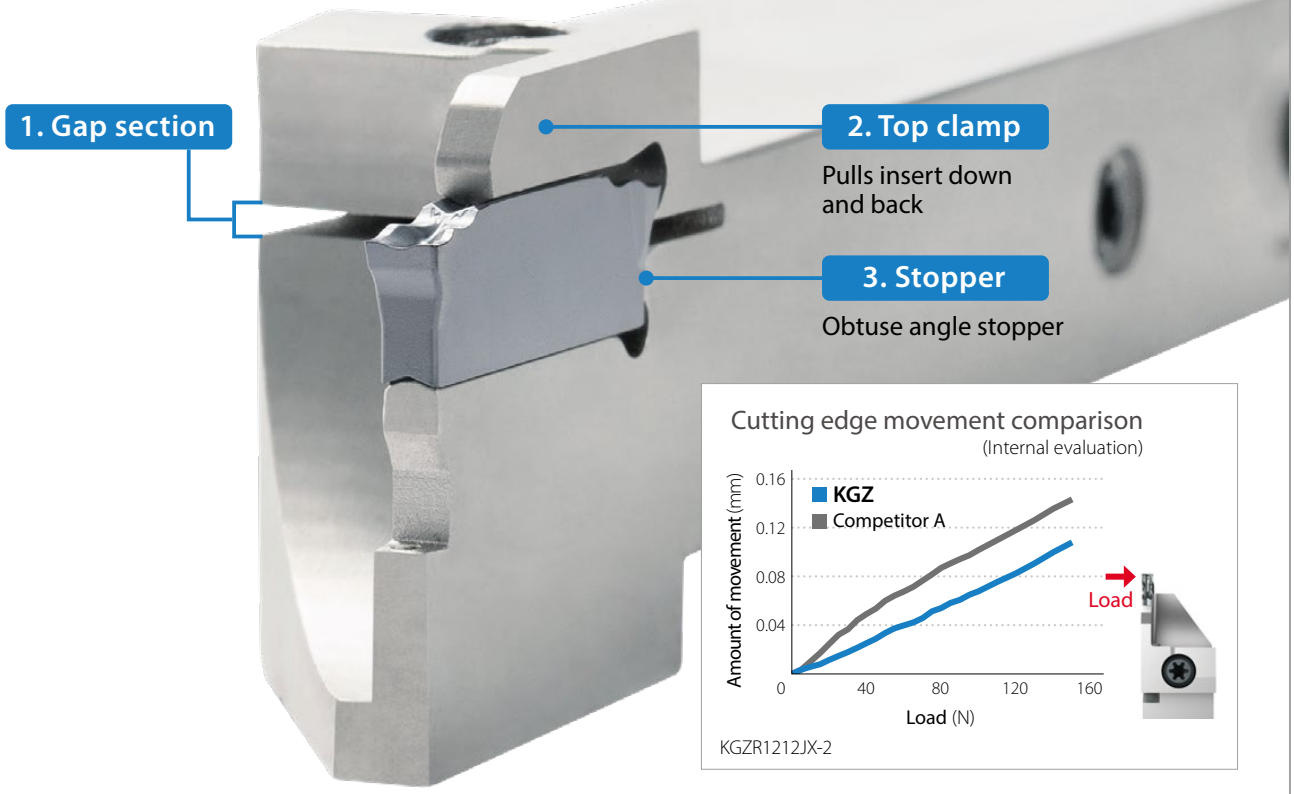
Tool holder	**Internal coolant** JCTM Series for direct coolant	**External coolant** Standard type / for Sub-spindle tooling

1 Achieved stable machining with newly developed clamp structure

Toolholder Sturdy clamps

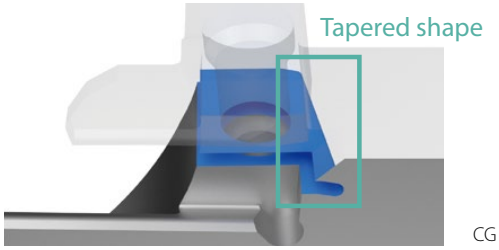
Three unique features

Strength

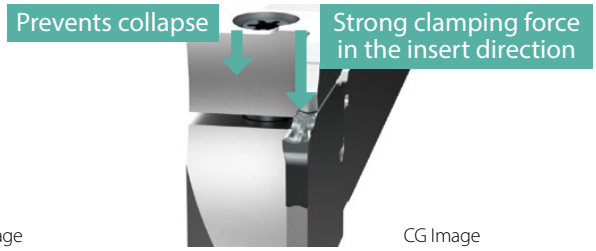


1. Gap section

Tapered slit creates strong insert hold



CG Image



CG Image

2. Top clamp

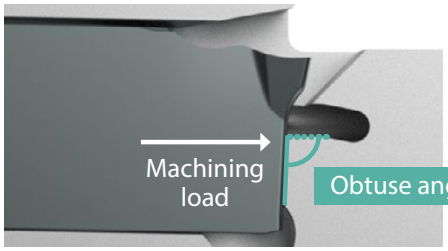
Pulls insert inward to increase hold

CG Image

3. Stopper

The insert stop is designed with an obtuse shape to resist machining load and a large surface area distributes stress

Improved holder durability for high-efficiency machining



CG Image

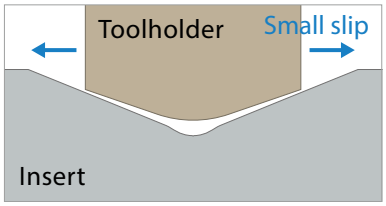
Insert Ease insert installation

Top V Shape Different groove angles at ends and center

Dependability

Groove End

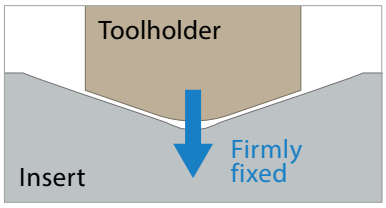
Small groove angle on top of insert
These grooves prevent the insert from shifting and provide fast and accurate insert mounts



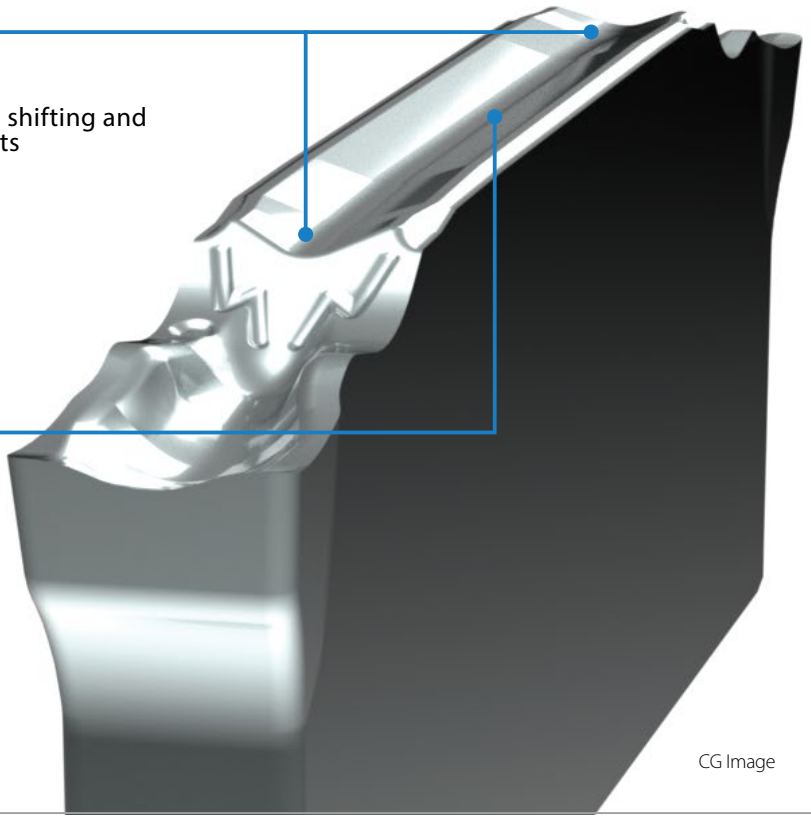
Image

Center of groove

Large groove angle on top of insert
Firmly engages the toolholder to increase hold



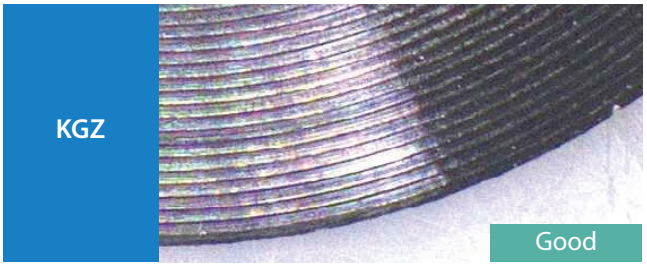
Image



CG Image

Excellent chatter resistance

Machined surface comparison (Internal evaluation)



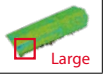
Cutting conditions : Vc = ~ 60 m/min, f = 0.12 mm/rev
Workpiece : SUS303 (ø14) Wet (External coolant) KGZR1212JX-2
Edge width : 2 mm (PM Chipbreaker)

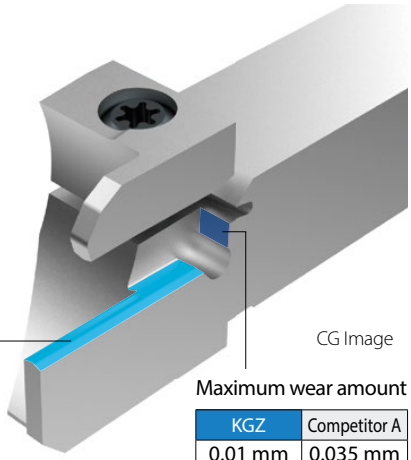
Strong toolholder durability

Toolholder durability comparison (Internal evaluation)

Toolholder damage comparison after 100,000 cuts

Maximum wear amount

KGZ	Competitor A
0.015 mm	0.02 mm
	 Large



CG Image

Maximum wear amount

KGZ	Competitor A
0.01 mm	0.035 mm
	 Large

Cutting conditions : Vc = ~ 80 m/min, f = 0.1 mm/rev
Workpiece : SUS303 (ø14) Wet (External coolant) KGZR1212JX-2
Edge width : 2 mm (PM Chipbreaker)

2 New insert grades PR20 series is available MEGACOAT NANO EX coating technology provides longer tool life

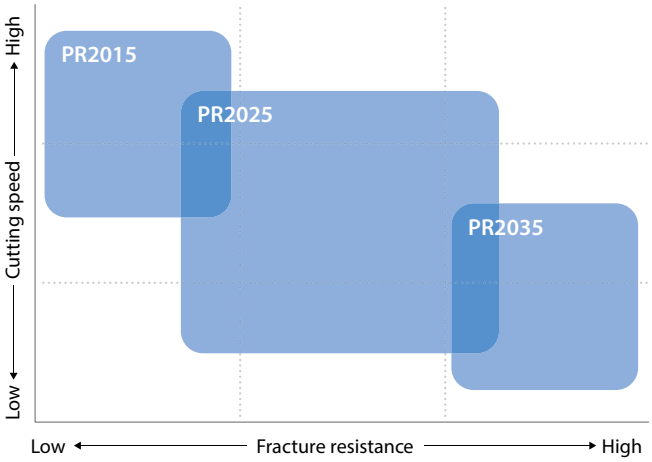
New insert grades for grooving and cut-off solutions

PR20 Series NEW

PR2015 **1st recommendation for cast iron**
Also available for steel and stainless steel

PR2025 **1st recommendation for steel**
Also available for stainless steel

PR2035 **1st recommendation for stainless steel**
Also available for steel

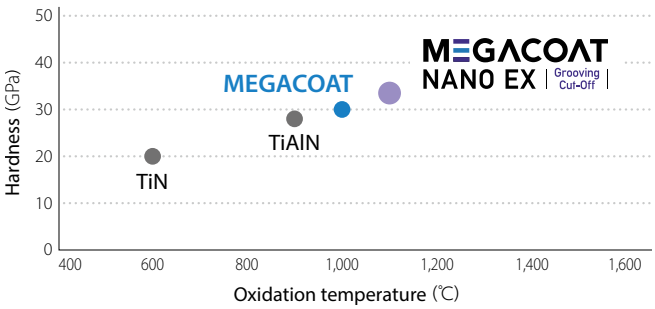


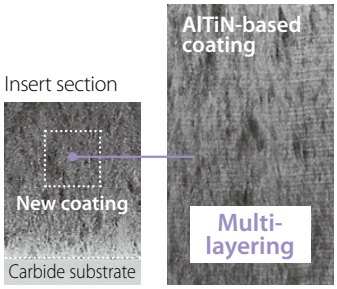
New coating for grooving and cut-off machining

MEGACOAT NANO EX | Grooving Cut-Off

Achieve long tool life and high stability with
the combination of high content aluminum nano coating layer

Coating characteristics (Internal evaluation)





Special nano coating layer

Long tool life — Excellent wear and fracture resistance

Multi-layering of high content aluminum nano layers added with high melting point material having different concentration

Suppresses hexagonal crystal precipitation and achieves excellent oxidation resistance

Stable machining — High coating toughness

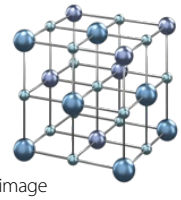
Crystal grain refinement

Optimized internal stress suppresses crack growth

Unique Technology (Patent applied)

Proprietary coating process Improve high content aluminum nano layers performance

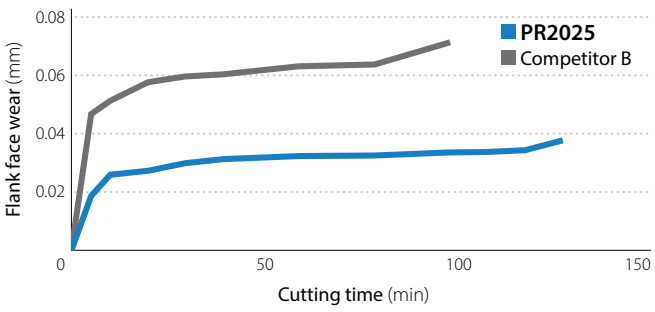
Maintains a cubic crystal structure to maximize the properties of aluminum (Al)



CG image

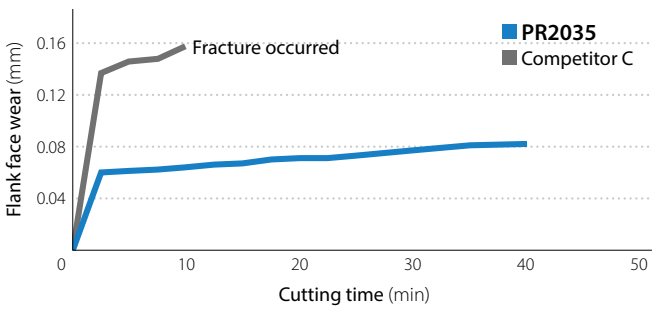
Cutting performance

S45C Wear resistance comparison (Internal evaluation)



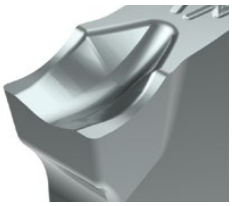
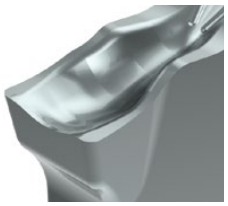
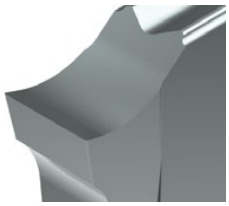
Cutting conditions : Vc = ~ 100 m/min, f = 0.1 mm/rev
Workpiece : S45C (ø20) Wet (External coolant) GZM2020N-020PM

SUS304 Wear resistance comparison (Internal evaluation)



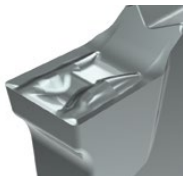
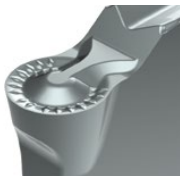
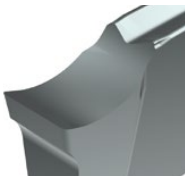
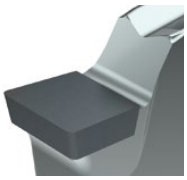
Cutting conditions : Vc = ~ 80 m/min, f = 0.05 mm/rev
Workpiece : SUS304 (ø20) Wet (External coolant) GZM2020N-020PM

3 Choose from a variety of insert and chipbreaker combinations for a wide range of applications

	Chip control oriented			Sharp edge
Chipbreakers (Cut-off)	Low feed machining **PF** Chipbreaker	Medium feed machining **PM** Chipbreaker	High feed machining **PH** Chipbreaker	Low cutting force **PG** Chipbreaker
				
	With/Without Lead angle	With/Without Lead angle	No Lead angle	With/Without Lead angle
Grades	PR2015 PR2025 PR2035	PR2015 PR2025 PR2035	PR2015 PR2025 PR2035	PR2025 PR2035 PDL025 GW15
Features	Edge width from 1.3 mm For reducing cost of steel workpiece	High versatility For a variety of machining	Reduced cycle time For high feed machining	Superior sharpness For aluminum alloy machining
				
	S10C "Chip control" video	SUS304 "Chip control" video	S45C "Chip control" video	A6061 "Chip control" video

Expanded lineup of grooving chipbreakers and insert grades NEW

Suitable for various workpiece materials and applications
High precision molding technology with tolerance ±0.03 mm
A comprehensive lineup of grades including the new PR20 series, cermet, and PCD

	General purpose **GM** Chipbreaker	Low feed **GL** Chipbreaker	Copying **CM** Chipbreaker	Low cutting force **GS** Chipbreaker	PCD **NB** (W/O chipbreaker)
Chipbreaker (Grooving)					
Grades	PR2015 PR2025 PR2035 TN620	PR2015 PR2025 PR2035 TN620	PR2015 PR2025 PR2035 TN620	PR2015 PR2025 PR2035 TN620 GW15	KPD001

4 Supports vibration/oscillation machining with stable chip control and longer tool life

Stable machining — Breaks chips into small pieces with vibration machining

SUS304 Chip control comparison (Internal evaluation)

PF Chipbreaker

Good — Breaks chips into small pieces

Cutting conditions : Vc = ~ 120 m/min, f = 0.03 mm/rev
Workpiece : SUS304 (ø14) Wet (External coolant) KGZR1212JX-2 Edge width : 2 mm

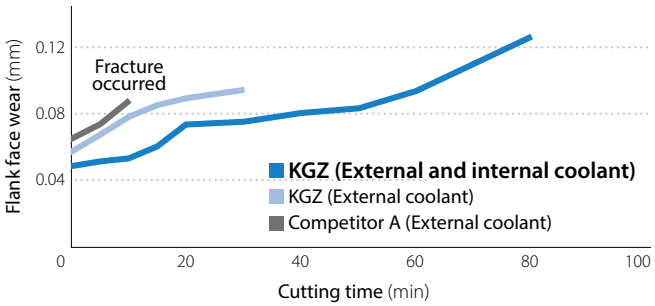
PM Chipbreaker

Good — Breaks chips into small pieces

Cutting conditions : Vc = ~ 120 m/min, f = 0.05 mm/rev
Workpiece : SUS304 (ø14) Wet (External coolant) KGZR1616JX-2 Edge width : 2 mm

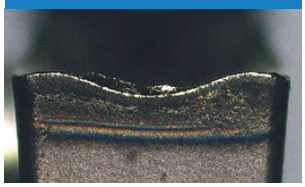
Long tool life — Extended tool life in combination with internal coolant (JCTM)

Wear resistance comparison (Internal evaluation)



Cutting edge condition

KGZ (External and internal coolant)



After 40 minutes machining

Competitor A (External coolant)

After 15 minutes machining

Cutting conditions : Vc = ~ 120 m/min, f = 0.05 mm/rev Workpiece : SUS304 (ø14) Wet KGZR1218JX-2JCTM Edge width : 2 mm (PM Chipbreaker)

Direct Coolant Holder for Small Parts Machining

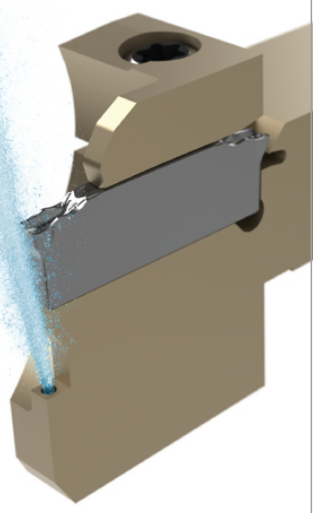
JCTM Series

Long tool life and stable machining by internal coolant with/ without piping system

Rectangular shank with optimized coolant channel design

1st recommendation

Square shank is also available



CG Image

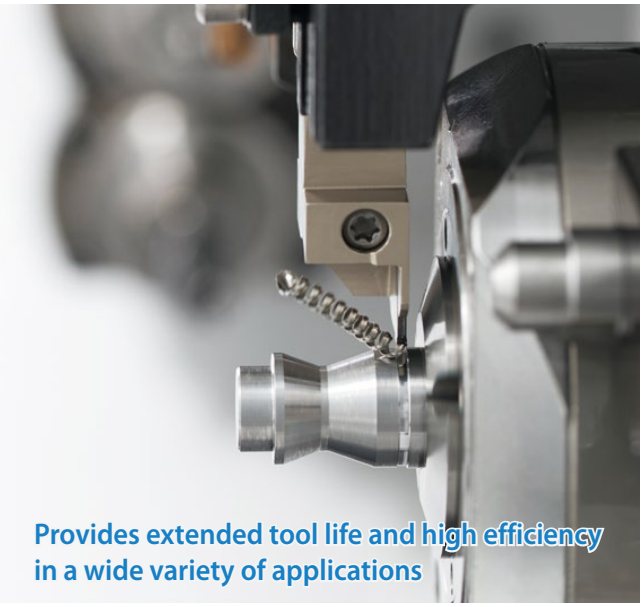
Without Piping When the tool turret supports direct coolant

- Coolant is supplied directly from tool turret into the holder
- No need for piping just by installing tools

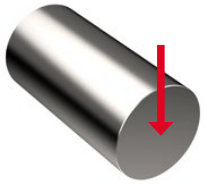
With Piping

- Compatible with internal coolant on any machine with standard piping parts

Case Studies



1 Pin SUS304



Cutting conditions
Vc = ~ 36 m/min
f = 0.02 mm/rev
Wet (External coolant)
ø15
KGZL1616JX-2
GZM2020N-020PM (PR2035)

Number of parts — **Tool life**

KGZ 10,000 pcs/corner — 2x

Competitor F 5,000 pcs/corner

Tool life was extended in stainless steel machining.
Machining surface quality and chip control were good.

(User evaluation)

2 Base metal S45C

Cutting conditions (KGZ)
Vc = ~ 104 m/min, f = 0.02 ~ 0.05 mm/rev
Wet (External coolant) ø9.7
Edge width : 2 mm
KGZL1212JX-2
GZM2020N-020PM (PR2025)

Cutting conditions (Competitor G)
Vc = ~ 86 m/min, f = 0.02 ~ 0.05 mm/rev
Wet (External coolant) ø9.7
Edge width : 2 mm

Machining efficiency — **Machining efficiency**

KGZ Vc = ~104m/min — UP

Competitor G Vc = ~86m/min

KGZ machined the workpieces equivalent to competitor G with higher cutting speed.
The cutting edge was good.

(User evaluation)

3 Automotive parts SUS304F

Cutting conditions
Vc = ~ 108 m/min
f = 0.12 mm/rev
Wet (External coolant)
ø15.2
KGZR1212JX-2
GZM2020N-020PM (PR2035)

Number of parts — **Tool life**

KGZ 250 pcs/corner — 1.9x

Competitor H 130 pcs/corner

Competitor H had welding. KGZ had no welding and good chip control. Achieved about 1.9 times longer tool life.

(User evaluation)

4 Wedge S48C

Cutting conditions
n = 2,100 min-1 (Constant)
f = 0.12 mm/rev
Wet (External coolant)
ø20
KGZR1616JX-3
GZM3020N-025PM (PR2015)

Number of parts — **Tool life**

KGZ 2,000 pcs/corner — 1.1x

Competitor I 1,800 pcs/corner

Longer tool life under high feed conditions (f = 0.12 mm/rev).

(User evaluation)

5 Sleeve 12Cr

Cutting conditions
Vc = ~ 72 m/min
f = 0.08 mm/rev
Wet (External coolant)
ø65
KGZR2020JX-3D42
GZM3020N-025PM (PR2025)

Number of parts — **Tool life**

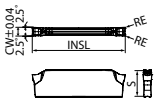
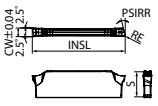
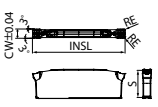
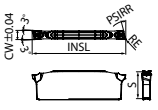
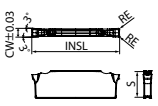
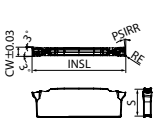
KGZ 200 pcs/corner — 2x

Competitor J 100 pcs/corner

Stable machining was possible even with hollow workpiece.
Double the tool life.

(User evaluation)

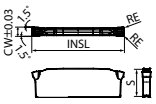
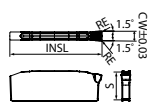
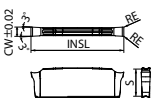
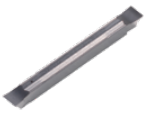
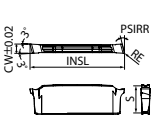
GZM (Cut-off)

	Shape Handed insert shows Right-hand		Description		No. of corners	Dimensions (mm)					Angle	MEGACOAT NANO EX			DLC coating	Carbide	Applicable Inserts
						CW	Tolerance	S	RE	INSL	PSIR R/L	PR2015	PR2025	PR2035	PDL025	GW15	
Low feed (Cut-off)			GZM	1316N-003PF	2	1.3	+0.04 -0.04	4.4	0.03	16	-	●	●	●			KGZ R/L...1.3(D16) KGZS R/L...1.3A/B
				1316N-015PF					0.15			●	●	●			
				1516N-003PF		1.5			0.03			●	●	●			KGZ R/L...1.5(D16) KGZ R/L...1.5A/B
				1516N-015PF					0.15			●	●	●			
	15° Lead angle		GZM	1316R-003PF-15D		1.3			0.03		15°	●	●	●			KGZ R/L...1.3(D16) KGZS R/L...1.3A/B
				1316L-003PF-15D								●	●	●			
				1516R-003PF-15D		1.5						●	●	●			KGZ R/L...1.5(D16) KGZS R/L...1.5A/B
				1516L-003PF-15D								●	●	●			
				1516R-015PF-15D					0.15			●	●	●			
			GZM	2020N-003PF		2			0.03			●	●	●			KGZ R/L...2(...) KGZS R/L...2A/B
				2020N-015PF					0.15			●	●	●			
				2520N-003PF		2.5			0.03		-	●	●	●			KGZ R/L...2(...) KGZ R/L...2.4(...) KGZS R/L...2A/B
				2520N-015PF					0.15			●	●	●			
				3020N-003PF		3			0.03			●	●	●			KGZ R/L...2(...) KGZ R/L...2.4(...) KGZ R/L...3(...) KGZS R/L...2A/B
				3020N-015PF					0.15			●	●	●			
	15° Lead angle		GZM	2020R-003PF-15D		2		5.9	0.03	20	15°	●	●	●			KGZ R/L...2(...) KGZS R/L...2A/B
				2020L-003PF-15D								●	●	●			
				2020R-015PF-15D					0.15			●	●	●			
				2520R-003PF-15D		2.5			0.03			●	●	●			KGZ R/L...2(...) KGZ R/L...2.4(...) KGZS R/L...2A/B
				2520L-003PF-15D								●	●	●			
				2520R-015PF-15D					0.15			●	●	●			
				3020R-003PF-15D		3			0.03			●	●	●			KGZ R/L...2(...) KGZ R/L...2.4(...) KGZ R/L...3(...) KGZS R/L...2A/B
				3020L-003PF-15D								●	●	●			
				3020R-015PF-15D					0.15			●	●	●			
Medium feed (Cut-off)			GZM	2020N-020PM	2	2	+0.03 -0.03	5.9	0.2	20	-	●	●	●			KGZ R/L...2(...) KGZS R/L...2A/B
				2520N-020PM		2.5						●	●	●			KGZ R/L...2(...) KGZ R/L...2.4(...) KGZS R/L...2A/B
				3020N-025PM		3			0.25			●	●	●			KGZ R/L...2(...) KGZ R/L...2.4(...) KGZ R/L...3(...) KGZS R/L...2A/B
	6° Lead angle		GZM	2020R-020PM-6D		2			0.2		6°	●	●	●			KGZ R/L...2(...) KGZS R/L...2A/B
				2520R-020PM-6D		2.5						●	●	●			KGZ R/L...2(...) KGZ R/L...2.4(...) KGZS R/L...2A/B
				3020R-025PM-6D		3			0.25			●	●	●			KGZ R/L...2(...) KGZ R/L...2.4(...) KGZ R/L...3(...) KGZS R/L...2A/B

Using PF or PM chipbreaker for grooving will not create a flat bottom.
GZM and GZG inserts cannot be installed in KGM and KGD holders.

● : Available

GZM/GZG (Cut-off)

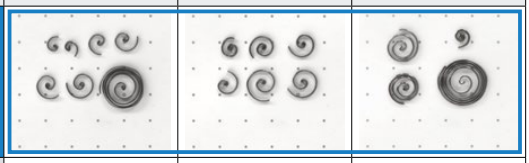
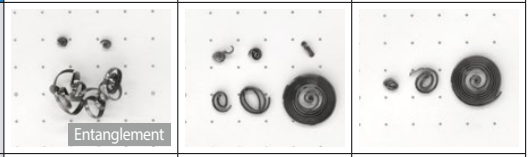
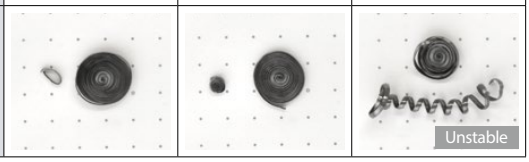
Shape (Handed insert shows Right-hand)			Description		No. of corners	Dimensions (mm)					Angle	MEGACOAT NANO EX			DLC coating	Carbide	Applicable Inserts
						CW	Tolerance	S	RE	INSL	PSIR R/L	PR2015	PR2025	PR2035	PDL025	GW15	
High feed (Cut-off / Grooving)			GZM	2020N-020PH	2	2	+0.03 -0.03	5.9	0.2	20	-	●	●	●			KGZ R/L...2(...) KGZS R/L...2A/B
				2520N-020PH	2	2.5						●	●	●			KGZ R/L...2(...) KGZ R/L...2.4(...) KGZS R/L...2A/B
				3020N-030PH	2	3			0.3			●	●	●			KGZ R/L...2(...) KGZ R/L...2.4(...) KGZ R/L...3(...) KGZS R/L...2A/B
	 1-edge		GZMS	2020N-020PH	1	2			0.2		-	●	●	●			KGZ R/L...2(...) KGZS R/L...2A/B
				3020N-030PH	1	3			0.3			●	●	●			KGZ R/L...2(...) KGZ R/L...2.4(...) KGZ R/L...3(...) KGZS R/L...2A/B
Low feed (Cut-off)			GZG	2020N-005PG	2	2	+0.02 -0.02	5.9	0.05	20	-		●	●	●	●	KGZ R/L...2(...) KGZS R/L...2A/B
				2520N-005PG	2	2.5							●	●	●	●	KGZ R/L...2(...) KGZ R/L...2.4(...) KGZS R/L...2A/B
				3020N-005PG	2	3							●	●	●	●	KGZ R/L...2(...) KGZ R/L...2.4(...) KGZ R/L...3(...) KGZS R/L...2A/B
	 15° Lead angle		GZG	2020R-005PG-15D	2	2					15°		●	●	●	●	KGZ R/L...2(...) KGZS R/L...2A/B
				2520R-005PG-15D	2	2.5							●	●	●	●	KGZ R/L...2(...) KGZ R/L...2.4(...) KGZS R/L...2A/B
				3020R-005PG-15D	2	3							●	●	●	●	KGZ R/L...2(...) KGZ R/L...2.4(...) KGZ R/L...3(...) KGZS R/L...2A/B

● : Available

Solution High efficiency machining with PH chipbreaker

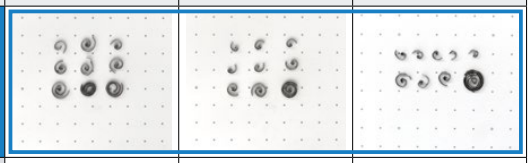
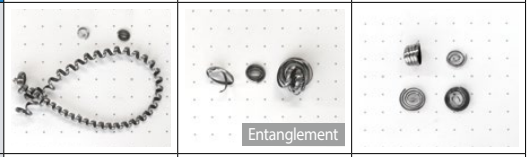
Supports high feed machining with f = ~ 0.2 mm/rev (steel) and f = ~ 0.16 mm/rev (stainless steel)
Excellent chip control in a wide range of machining area

S45C Chip control comparison (Internal evaluation)

f (mm/rev)	0.1	0.15	**0.2**
KGZ PH			
Competitor D	 Entanglement		
Competitor E	 Unstable		

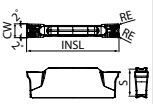
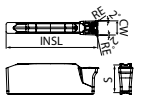
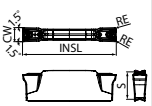
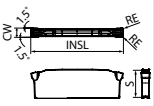
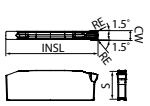
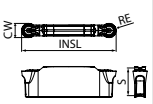
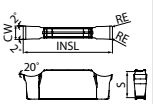
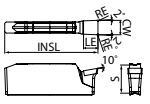
Cutting conditions : Vc = ~ 150 m/min Workpiece : S45C (ø14) Wet (External coolant)
KGZR1616JX-2 Edge width : 2 mm (PH Chipbreaker)

SUS304 Chip control comparison (Internal evaluation)

f (mm/rev)	0.1	0.12	**0.16**
KGZ PH			
Competitor D	 Entanglement		
Competitor E	 Unstable		

Cutting conditions : Vc = ~ 80 m/min Workpiece : SUS304 (ø14) Wet (External coolant)
KGZR1616JX-2 Edge width : 2 mm (PH Chipbreaker)

GZM/GZG (Grooving)

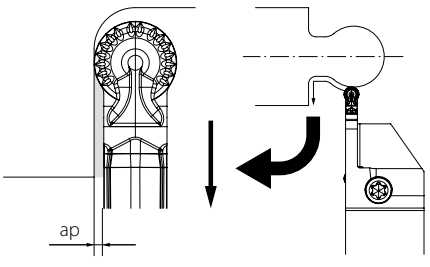
Shape (Handed insert shows Right-hand)			Description		Edge preparation	No. of corners	Dimensions (mm)						MEGACOAT NANO EX			Carbide	Cermet	PCD	Applicable Inserts
							CW	Tolerance	S	RE	INSL	LE	PR2015	PR2025	PR2035	GW15	TN620	KPD001	
General purpose (Grooving)			GZM	2420N-020GM	-	2	2.4	+0.03 -0.03	5.9	0.2	20	-	●	●	●		●		KGZ R/L...2(...) KGZ R/L...2.4(...) KGZS R/L...2A/B
				3020N-020GM			3						●	●	●		●		KGZ R/L...2(...) KGZ R/L...2.4(...) KGZ R/L...3(...) KGZS R/L...2A/B
				3020N-040GM						0.4			●	●	●		●		
	1-edge		GZMS	2220N-020GM	-	1	2.2		5.9	0.2	20		●	●	●		●		KGZ R/L...2(...) KGZS R/L...2A/B
				3020N-040GM			3			0.4			●	●	●		●		KGZ R/L...2(...) KGZ R/L...2.4(...) KGZ R/L...3(...) KGZS R/L...2A/B
Low feed (Grooving)			GZM	2420N-020GL	-	2	2.4	+0.03 -0.03	5.9	0.2	20	-	●	●	●		●		KGZ R/L...2(...) KGZ R/L...2.4(...) KGZS R/L...2A/B
				3020N-020GL			3						●	●	●		●		KGZ R/L...2(...) KGZ R/L...2.4(...) KGZ R/L...3(...) KGZS R/L...2A/B
				3020N-040GL						0.4			●	●	●		●		
High feed (Cut-off / Grooving)			GZM	2020N-020PH	-	2	2	+0.03 -0.03	5.9	0.2	20	-	●	●	●				KGZ R/L...2(...) KGZS R/L...2A/B
				2520N-020PH			2.5						●	●	●				KGZ R/L...2(...) KGZ R/L...2.4(...) KGZS R/L...2A/B
				3020N-030PH			3			0.3			●	●	●				KGZ R/L...2(...) KGZ R/L...2.4(...) KGZ R/L...3(...) KGZS R/L...2A/B
	1-edge		GZMS	2020N-020PH	-	1	2			0.2		-	●	●	●				KGZ R/L...2(...) KGZS R/L...2A/B
				3020N-030PH			3			0.3			●	●	●				KGZ R/L...2(...) KGZ R/L...2.4(...) KGZ R/L...3(...) KGZS R/L...2A/B
Copying (Grooving)			GZM	3020N-150R-CM	-	2	3	+0.03 -0.03	5.9	1.5	20	-	●	●	●		●		KGZ R/L...2(...) KGZ R/L...2.4(...) KGZ R/L...3(...) KGZS R/L...2A/B
Low cutting force (Grooving)			GZG	2520N-020GS	-	2	2.5	+0.02 -0.02	5.9	0.2	20	-	●	●	●	●	●		KGZ R/L...2(...) KGZ R/L...2.4(...) KGZS R/L...2A/B
				3020N-020GS			3						●	●	●	●	●		KGZ R/L...2(...) KGZ R/L...2.4(...) KGZ R/L...3(...) KGZS R/L...2A/B
PCD (Grooving)	1-edge		GZGS	2020N-020NB	F	1	2	+0.03 -0.03	5.9	0.2	20	2.9						●	KGZ R/L...2(...) KGZS R/L...2A/B
				3020N-020NB			3											●	KGZ R/L...2(...) KGZ R/L...2.4(...) KGZ R/L...3(...) KGZS R/L...2A/B

● : Available

CM chipbreaker [Depth of cut (ap) in back copying]

Maximum ap in back copying

Description	Maximum ap (mm)		
	Toolholder description		
	KGZ...2(···)	KGZ...2.4(···)	KGZ...3(···)
GZM3020N-150R-CM	0.24	0.24	0.2



Recommended Cutting Conditions ★1st recommendation ☆2nd recommendation

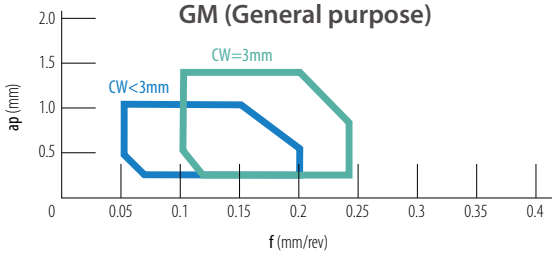
Cut-off

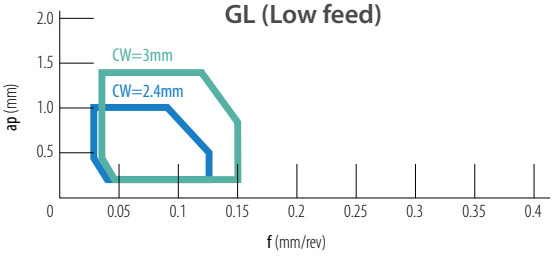
Workpiece	Vc (m/min)					f (mm/rev)										Remarks
	MEGACOAT NANO EX			DLC	Carbide	PF (RE = 0.03)			PF (RE = 0.15)			PM	PH	PG		
						CW (mm)										
	PR2015	PR2025	PR2035	PDL025	GW15	1.3/1.5	2.0	2.5/3.0	1.3/1.5	2.0	2.5/3.0	2.0~3.0	2.0~3.0	2.0	2.5/3.0	
Carbon steel	☆ 70~180	★ 70~150	☆ 70~150	-	-	0.01~ 0.04	0.02~ 0.06	0.02~ 0.08	0.01~ 0.05	0.03~ 0.08	0.04~ 0.10	0.05~ 0.15	0.10~ 0.20	0.01~ 0.04	0.01~ 0.05	Wet
Alloy steel	☆ 70~180	★ 70~150	☆ 70~150	-	-											
Stainless steel	☆ 60~150	☆ 60~120	★ 60~120	-	-	0.01~ 0.03	0.01~ 0.04	0.01~ 0.05	0.01~ 0.04	0.03~ 0.07	0.04~ 0.08	0.04~ 0.12	0.08~ 0.16	0.01~ 0.03	0.01~ 0.04	
Cast iron	★ 80~200	-	-	-	☆ 50~100	0.01~ 0.05	0.02~ 0.07	0.03~ 0.08	0.01~ 0.06	0.03~ 0.09	0.04~ 0.10	0.05~ 0.15	0.10~ 0.20	0.01~ 0.04	0.01~ 0.05	
Aluminum alloy	-	-	-	★ 200~500	☆ 200~450	-	-	-	-	-	-	-	-	0.01~ 0.05	0.01~ 0.06	
Brass	-	-	-	-	★ 100~200	-	-	-	-	-	-	-	-	0.01~ 0.07	0.01~ 0.08	

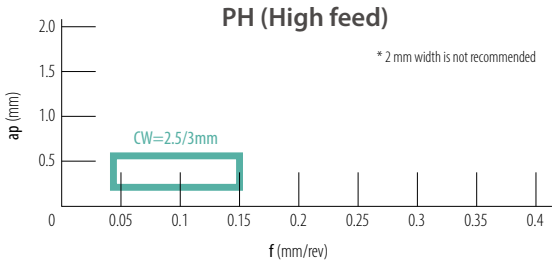
Grooving

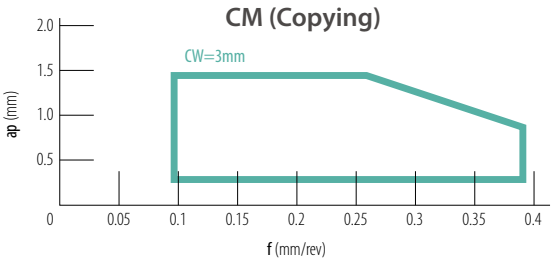
Workpiece	Vc (m/min)						f (mm/rev)									Remarks
	MEGACOAT NANO EX			Cermet	Carbide	PCD	GM		GL		PH	CM	GS	NB		
							CW (mm)									
	PR2015	PR2025	PR2035	TN620	GW15	KPD001	2.2/2.4	3.0	2.4	3.0	2.0~3.0	3.0	2.5/3.0	2.0	3.0	
Carbon steel	☆ 70~180	★ 70~150	☆ 70~150	★ 80~150	-	-	0.05~ 0.13	0.07~ 0.17	0.03~ 0.11	0.04~ 0.15	0.10~ 0.20	0.05~ 0.15	0.04~ 0.09	-	-	Wet
Alloy steel	☆ 70~180	★ 70~150	☆ 70~150	★ 80~150	-	-										
Stainless steel	☆ 60~150	☆ 60~120	★ 60~120	-	-	-	0.03~ 0.12	0.05~ 0.15	0.02~ 0.10	0.03~ 0.12	0.08~ 0.16	0.04~ 0.12	0.03~ 0.08	-	-	
Cast iron	★ 80~200	-	-	-	☆ 50~100	-	0.05~ 0.13	0.07~ 0.17	0.03~ 0.11	0.04~ 0.15	0.10~ 0.20	0.05~ 0.15	0.04~ 0.09	-	-	
Aluminum alloy	-	-	-	-	☆ 200~450	★ 150~2,000	-	-	-	-	-	-	0.03~ 0.07	0.05~ 0.15	0.05~ 0.15	
Brass	-	-	-	-	☆ 100~200	★ 200~800	-	-	-	-	-	-	-			

Turning
(Workpiece material : S50C)

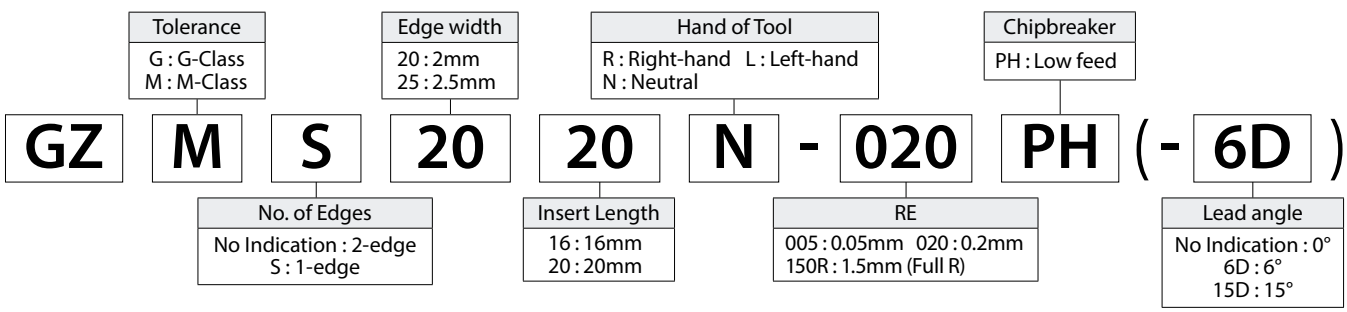








Inserts Identification System



KGZ-JCTM (Internal coolant)

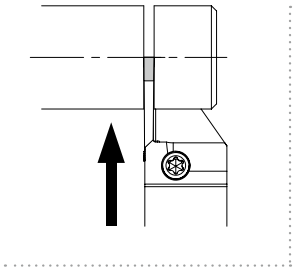
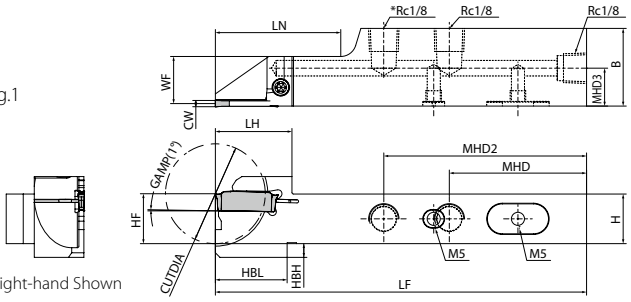
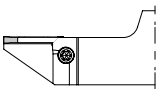


Fig.1

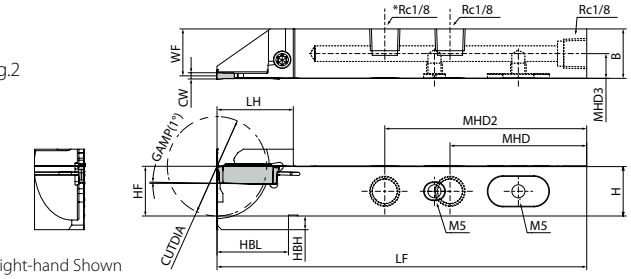


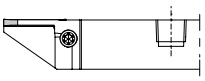


Above figure shows KGZL... (left-hand)

· Right-hand Shown

Fig.2





Above figure shows KGZL... (left-hand)

· Right-hand Shown

KGZ R/L12... has no *Rc 1/8

Description	Stock		Dimensions (mm)													Edge width CW (mm)		Shape	Spare Parts				Applicable Inserts
	R	L	CUTDIA	H	B	LH	MHD	MHD2	MHD3	HF	HBH	HBL	LF	LN	WF	MIN.	MAX.		Plug 1	Plug 2	Clamp Screw	Wrench	
KGZR 1218JX-2JCTM	●		24	12	18	19.8	54	-	8.4	12	8.5	19.8	120	43.7	11.2	2	3	Fig.1	GP-1	HS5X 4LP	SB-40120 TR	LTW-15S	GZ...2020... GZ...2220... GZ...2420... GZ...2520... GZ...3020...
KGZL 1218JX-2JCTM		●							7.7														
KGZR 1625JX-2JCTM	●		32	16	25	24.8	44	65	12.2	16	4.5	23.2		40.0	15.2								
KGZL 1625JX-2JCTM		●							7.7														
KGZR 1218JX-2.4JCTM	●		24	12	18	19.8	54	-	8.4	12	8.5	19.8	120	43.7	11.0	2.4	3	Fig.1	GP-1	HS5X 4LP	SB-40120 TR	LTW-15S	GZ...2420... GZ...2520... GZ...3020...
KGZL 1218JX-2.4JCTM		●							7.7														
KGZR 1625JX-2.4JCTM	●		32	16	25	24.8	44	65	12.2	16	4.5	23.2		40.0	15.0								
KGZL 1625JX-2.4JCTM		●							7.7														
KGZR 1218JX-3JCTM	●		24	12	18	19.8	54	-	8.6	12	8.5	19.8	120	43.7	10.8	3	3	Fig.1	GP-1	HS5X 4LP	SB-40120 TR	LTW-15S	GZ...3020...
KGZL 1218JX-3JCTM		●							7.7														
KGZR 1625JX-3JCTM	●		32	16	25	24.8	44	65	12.2	16	4.5	23.2		40.0	14.8								
KGZL 1625JX-3JCTM		●							7.7														
KGZ R/L 1212JX-2JCTM	●	●	24	12	12	19.8	59	-	6	12	5	19.8	120	-	11.2	2	3	Fig.2	GP-1	HS5X 4LP	SB-40120 TR	LTW-15S	GZ...2020... GZ...2220... GZ...2420... GZ...2520... GZ...3020...
KGZ R/L 1616JX2D26JCTM*	●	●	26	16	16	24.8	44	65	8	16	1	23.2			15.2								
KGZ R/L 1616JX-2JCTM	●	●	32								4.5												
KGZ R/L 1212JX-2.4JCTM	●	●	24	12	12	19.8	59	-	6	12	5	19.8	120		11.0	2.4	3	Fig.2	GP-1	HS5X 4LP	SB-40120 TR	LTW-15S	GZ...2420... GZ...2520... GZ...3020...
KGZ R/L 1616JX2.4D26JCTM*	●	●	26	16	16	24.8	44	65	8	16	1	23.2			15.0								
KGZ R/L 1616JX-2.4JCTM	●	●	32								4.5												
KGZ R/L 1212JX-3JCTM	●	●	24	12	12	19.8	59	-	6	12	5	19.8	120		10.8	3	3	Fig.2	GP-1	HS5X 4LP	SB-40120 TR	LTW-15S	GZ...3020...
KGZ R/L 1616JX3D26JCTM*	●	●	26	16	16	24.8	44	65	8	16	1	23.2			14.8								
KGZ R/L 1616JX-3JCTM	●	●	32								4.5												

Recommended tightening torque : 2.0N · m(SB-40120TR)

● : Available

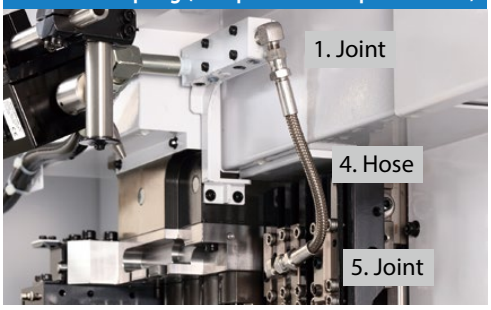
GM* and GD* inserts cannot be installed in the KGZ holder (GMM, GMG, GMN, GMR/L, GDM, GDG, GDGS, GDMS).

*Release date to be announced

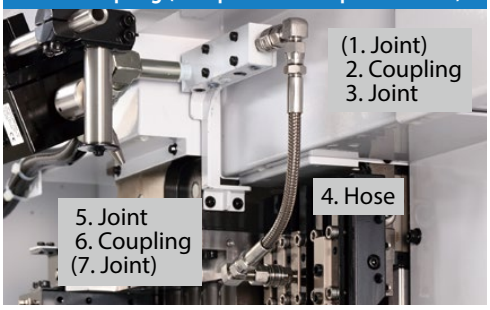
Piping parts will be required separately if internal coolant is used.

Pump Pressure : Up to 20 MPa. Pump Pressure: Up to 7.5 MPa if coupling is used.

Without Coupling (Pump Pressure: Up to 20 MPa)



With Coupling (Pump Pressure: Up to 7.5 MPa)



Combination Part Description (Example)

Spare Parts	Description
1. Joint	J-AN-R1/8-G1/8
4. Hose	HS-G1/8-G1/8-200
5. Joint	J-AN-R1/8-G1/8

Convert the thread standards on the machine's side (Rc1/4, Rc1/8, NPT1/8, etc.) to the thread standard on the hose side (G1/8) for use.
Use sealing agents such as seal tapes when installing piping parts.

Combination Part Description (Example)

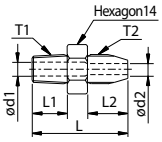
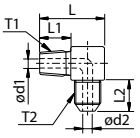
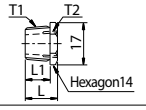
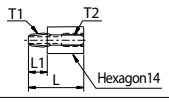
Spare Parts	Description
(1. Joint)	–
2. Coupling	CP-ST-R1/8, P-ST-RC1/8
3. Joint	J-AN-R1/8-G1/8
4. Hose	HS-G1/8-G1/8-200
5. Joint	J-AN-R1/8-G1/8
6. Coupling	P-ST-RC1/8, CP-ST-R1/8
(7. Joint)	–

Convert the thread standards on the machine's side (Rc1/4, Rc1/8, NPT1/8, etc.) to thread standards of the coupling (Rc1/8, etc.) or hose (G1/8) for use.
Use sealing agents such as seal tapes when installing piping parts.

Piping Part Dimensions

Joint (1/3/5/7) Pressure : ~20.0MPa

(Unit:mm)

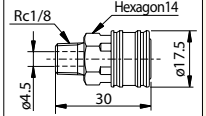
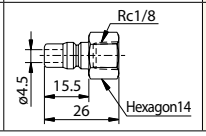
Shape		Description	Stock	ød1	ød2	L	L1	L2	T1	T2
		J-ST-R1/4-G1/8	●	5.5	4.0	34	13	13	R1/4	G1/8
		J-ST-NPT1/8-G1/8	●	3.5	3.5	29	10	13	NPT1/8	G1/8
		J-ST-R1/8-G1/8	●	4.0	4.0	29	10	13	R1/8	G1/8
		J-ST-R1/8-G1/8-L*	●	4.0	4.0	40	20	14	R1/8	G1/8
		J-AN-R1/8-G1/8	●	4.0	4.0	27	14	13	R1/8	G1/8
		J-AN-R1/8-G1/8-L*	●	4.0	4.0	34	20	14	R1/8	G1/8
		J-ST-R1/4-RC1/8	●	–	–	17	12	–	R1/4	Rc1/8
		J-ST-NPT1/8-RC1/8	●	3.5	–	30	10	–	NPT1/8	Rc1/8
		J-ST-R1/8-RC1/8	●	3.5	–	33	13	–	R1/8	Rc1/8

Elbow piping (J-AN-R1/8-G1/8) is recommended. *Release date to be announced

● : Available

Coupling (2/6) Pressure : ~7.5MPa

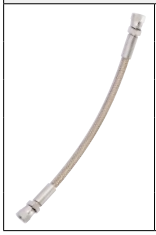
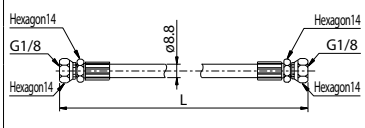
(Unit:mm)

Shape		Description	Stock
		CP-ST-R1/8	●
		P-ST-RC1/8	●

● : Available

Hose (4) Pressure : ~20.0MPa

(Unit:mm)

Shape		Description	Stock	L
		HS-G1/8-G1/8-200	●	200
		HS-G1/8-G1/8-300	●	300
		HS-G1/8-G1/8-400	●	400
		HS-G1/8-G1/8-500	●	500
		HS-G1/8-G1/8-600	●	600
		HS-G1/8-G1/8-800	●	800

● : Available

KGZ (Standard toolholders)

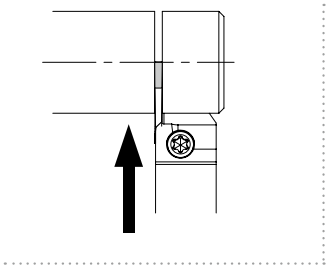


Fig.1

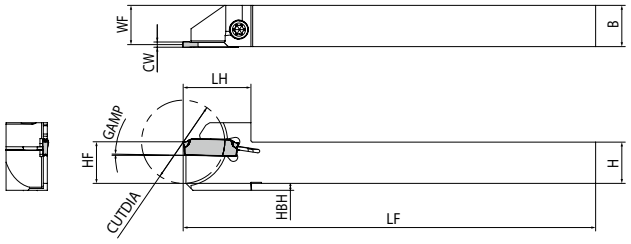
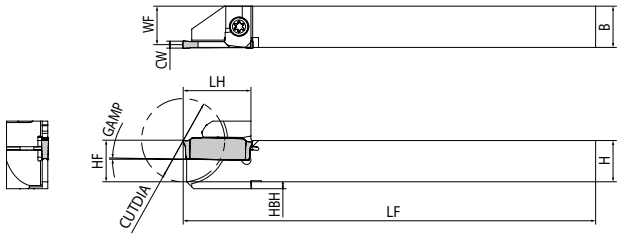


Fig.2



· Right-hand Shown

Description		Stock		Dimensions (mm)								Edge width CW (mm)		Angle	Shape	Spare Parts		Applicable Inserts
																Clamp Screw	Wrench	
		R	L	CUTDIA	H	B	LH	HF	HBH	LF	WF	MIN.	MAX.	GAMP				
KGZ R/L	1010JX-1.3D16	●	●	16	10	10	17.8	10	2.1	120	9.5	1.3	1.3	1°	Fig.1	SB-40120TR	LTW-15S	GZ…1316…
	1010JX-1.3	●	●	20			18.7											
	1212F-1.3D16	●	●	16	12	12	17.8	12		85	11.5							
	1212JX-1.3D16	●	●							120								
	1212F-1.3	●	●	24			19.8			85								
	1212JX-1.3	●	●							120								
KGZ R/L	1010JX-1.5D16	●	●	16	10	10	17.8	10	2.1	120	9.4	1.5	1.5					GZ...1516...
	1010JX-1.5	●	●	20			18.7											
	1212F-1.5D16	●	●	16	12	12	17.8	12		85	11.4							
	1212JX-1.5D16	●	●							120								
	1212F-1.5	●	●	24			19.8			85								
	1212JX-1.5	●	●							120								
KGZ R/L	1010JX-2	●	●	20	10	10	18.7	10	2.1	120	9.2	2	3	2°	Fig.2	SB-40120TR	LTW-15S	GZ...2020... GZ...2220... GZ...2420... GZ...2520... GZ...3020...
	1212F-2	●	●	24	12	12	19.8	12		85	11.2			1°				
	1212JX-2	●	●							120								
	1616JX-2	●	●	32	16	16	24.8	16	-		15.2							
	2012K-2D34	●	●	34	20	12	26.8	20		125	11.2					SE-50125TR	LTW-20	
	2020K-2D34	●	●			20					19.2							
	2525K-2D34	●	●		25	25	32.7	25			24.2					HH5X16	LW-4	
KGZ R/L	1010JX-2.4	●	●	20	10	10	18.7	10	2.1	120	9	2.4	3	2°		SB-40120TR	LTW-15S	GZ...2420... GZ...2520... GZ...3020...
	1212F-2.4	●	●	24	12	12	19.8	12		85	11			1°				
	1212JX-2.4	●	●							120								
	1616JX-2.4	●	●	32	16	16	24.6	16	-		15							
	2012K-2.4D34	●	●	34	20	12	26.6	20		125	11					SE-50125TR	LTW-20	
	2020K-2.4D34	●	●			20					19							
	2525K-2.4D34	●	●		25	25	32.7	25			24					HH5X16	LW-4	
KGZ R/L	1212JX-3	●	●	24	12	12	19.8	12	2.1	120	10.8	3	3	1°		SB-40120TR	LTW-15S	GZ...3020...
	1616JX-3	●	●	32	16	16	24.6	16	-		14.8							
	1616JX-3D38	●	●	38			28.6									SE-50125TR	LTW-20	
	1913K-3D38	●	●		19	13		19		125	11.8							
	2012JX-3D42	●	●	42	20	12	30.7	20		120	10.8							
	2012JX-3D51	●	●	51			35.2											
	2020JX-3D42	●	●	42		20	30.7				18.8							
	2020JX-3D51	●	●	51			35.2											
	2525K-3D51	●	●		25	25	41.7	25		125	23.8					HH5X16	LW-4	

Recommended tightening torque : 2.0N · m(SB-40120TR), 2.5N · m(SE-50125TR), 6.5N · m (HH5X16)

● : Available

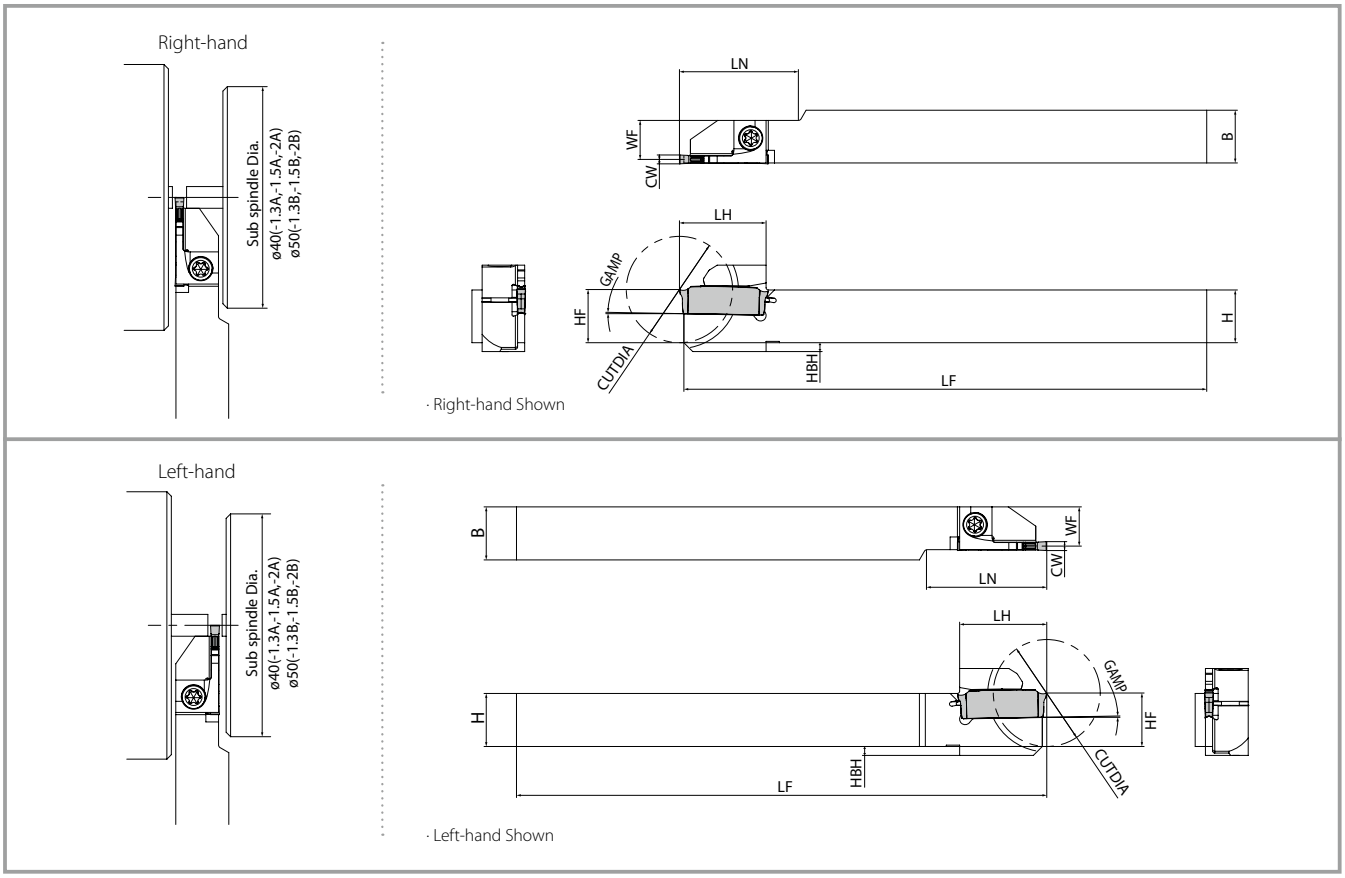
When machining large cutting dia. (over 36 mm) with KGZ R/L....-3D38 or KGZ R/L...-3D42, please follow the instructions below

· Use 1-edge inserts

· Maximum workpiece diameter for 2-edge inserts is ø36

KGM* and GD* inserts cannot be installed in the KGZ holder (GMM, GMG, GMN, GMR/L, GDM, GDG, GDGS, GDMS).

KGZS (for Cut-off operation near sub spindle side)



Description		Stock		Dimensions (mm)									Edge width CW (mm)		Angle	Spare Parts		Applicable Inserts
		R	L	CUTDIA	H	B	LH	HF	HBH	LF	LN	WF	MIN.	MAX.	GAMP	Clamp Screw	Wrench	
KGZS R/L	1212F-1.3A	●	●	24	12	12	19.8	12	2.1	85	22	8.4	1.3	1.3	1°	SB-40120TR	LTW-15S	GZ...1316...
	1212JX-1.3B	●	●							120	27							
	1616JX-1.3B	●	●		16	16		16	-									
	1212F-1.5A	●	●		12	12		12	2.1	85	22	8.4	1.5	1.5				GZ...1516...
	1212JX-1.5B	●	●							120	27							
	1616JX-1.5B	●	●		16	16		16	-									
	1212F-2A	●	●		12	12		12	2.1	85	22	8.7	2	3				GZ...2020..., GZ...2220..., GZ...2420..., GZ...2520..., GZ...3020...
	1212JX-2B	●	●							120	27							
	1616JX-2B	●	●		16	16		16	-									

● : Available

Toolholder Identification System

KGZ
KGZS

Type
No Indication : Standard
S : for Sub Spindle Tooling

R — Toolholder Hand
R : Right-hand
L : Left-hand

1212 — Shank Size
1212 : 12×12mm
1218 : 12×18mm

JX — Overhang Length
F : 85mm
JX : 120mm
K : 125mm

-

2 — Applicable Inserts
GZM/GZG
Edge width 1.3 ~ 3mm

D34 — CUTDIA
D16 : 16mm D38 : 38mm
D26 : 26mm D42 : 42mm
D34 : 34mm D51 : 51mm

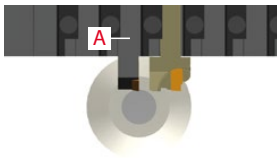
B — Others
A/B : for Sub Spindle Tooling
A : LN 22 mm
B : LN 27 mm

Precautions

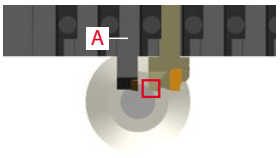
Maximum ap of the next tool (indicated as tool A) and holder interference

When using JCTM holder 1218/1212 , note maximum ap of the next tool to avoid interference.

No interference



Interference



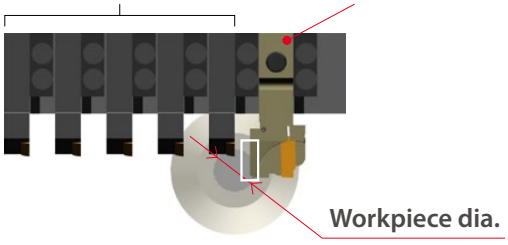
Estimated maximum ap of tool A (mm)

Workpiece dia. / JCTM Description	ø12	ø16	ø20
KGZ R/L 1218JX-*JCTM	2.4	2.0	1.7
KGZ R/L 1212JX-*JCTM	-	-	3.8

When using the JCTM holder 1218/1625/1616 for T01 on the following target models, please check the workpiece diameter in advance to avoid interference.

<Target Models>
T01: Machines where both □16 (or Spacer plate +□12) holders can be mounted
Non-T01: Machines where only □12 holders can be mounted

Non-T01:□12 **T01 :□16 (or Spacer plate +□12)**



KGZ Compatibility

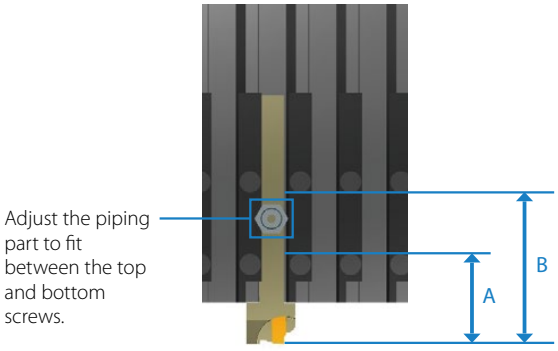
Workpiece dia. / JCTM Description	ø14 or smaller	ø14 or larger
KGZ R/L 1218JX-*JCTM	Compatible	Please use KGZ R/L 1212JX-*JCTM or KGZ R/L 1616JX*D26JCTM
KGZ R/L 1625JX-*JCTM		
KGZ R/L 1616JX-*JCTM		

Piping part interference avoidance

Rectangular shank (KGZR/L1218..., KGZR/L1625...) are recommended for use with piping parts connected to JCTM holders.

When connecting the J-**-R1/8-G1/8-L piping parts to the rectangular shank, please check for any potential interference with the machine in advance.

When connecting piping parts to the JCTM square shank, check the lengths of A and B below to avoid interference with the screws of the tool turret.

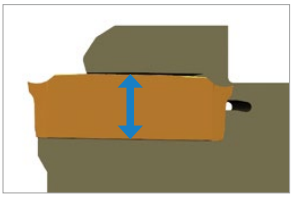


Shank Size	Availability of square shank use
□12	"A" shorter than 51.5 mm and "B" longer than 68.5 mm → Available Other than the above conditions → Use J-**-R1/8-G1/8-L or a rectangular shank
□16	Available

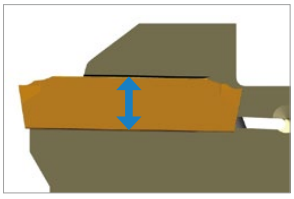
Compatibility with conventional tools

KGZ is not compatible with the conventional tools (KGD/KGM)

KGZ

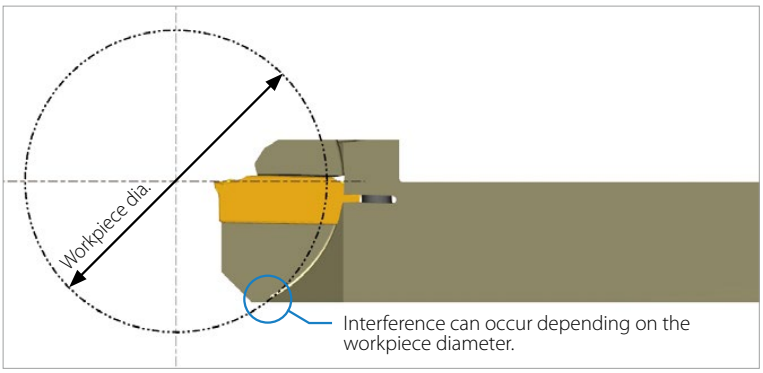


Conventional



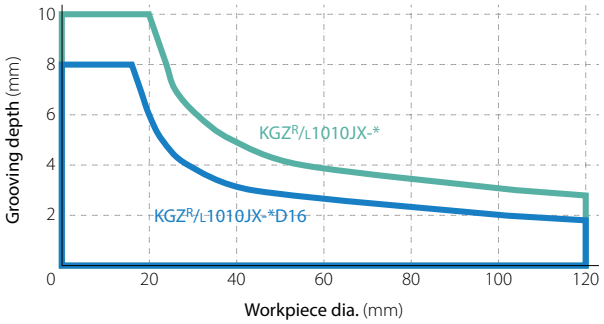
Limitation on maximum grooving depth

There is a limit to available grooving depth depending on the workpiece diameter.

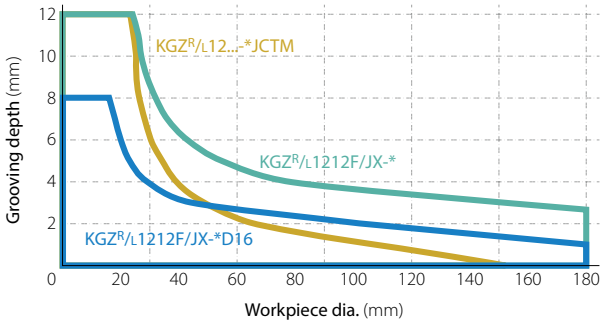


Guideline for grooving depth

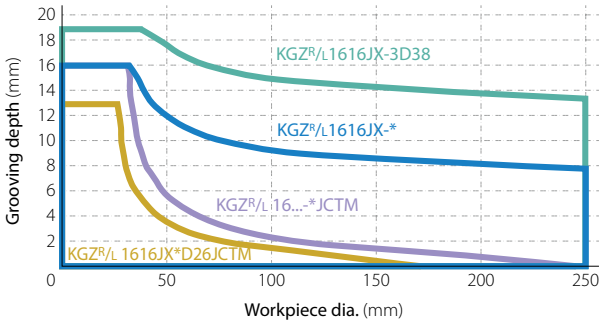
☐10 toolholders



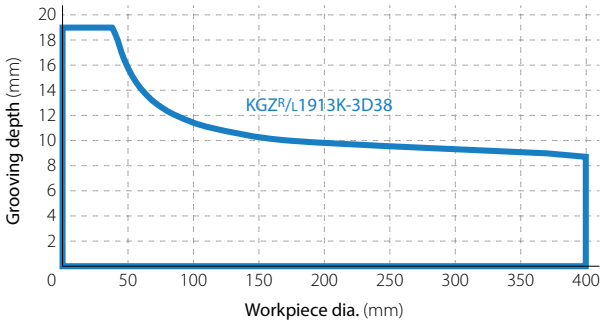
☐12 toolholders



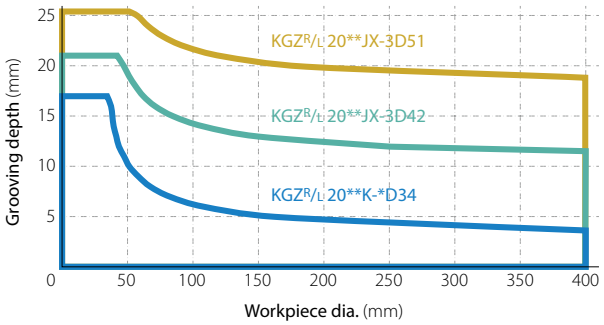
☐16 toolholders



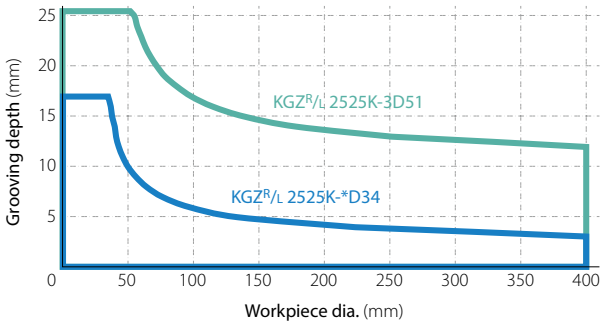
☐19 toolholders



☐20 toolholders



☐25 toolholders



Tips for external grooving

Point 1 - Turning after grooving

1. Grooving depth over 0.5 mm : For roughing - refer to fig. 1
   Before turning, pull the tool back about 0.1mm after grooving, instead of turning subsequent to grooving.
   (To apply the lead on the cutting edge in only one direction)

2. Grooving depth under 0.5 mm : For finishing - refer to fig. 2
   Turning subsequent to grooving is possible because shallow groove depths result in a small load on the cutting edge.
   Retention time is not necessary.

Point 2

1. When widening the groove width (Refer to Fig.3), apply the "Step Turning."

2. The widened groove and side walls should be finished last. For better chip control, ap over 0.5 mm is recommended.

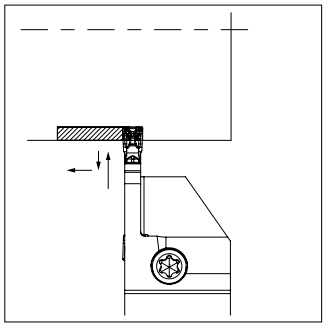


Fig.1
Before turning, pull the tool back about 0.1 mm after grooving.
Grooving depth over 0.5 mm : At roughing

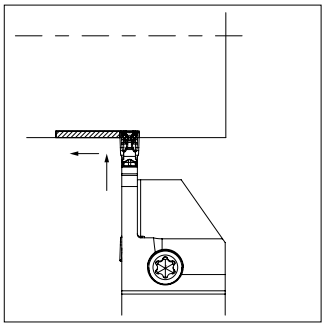


Fig.2
Turning subsequent to grooving.
Grooving depth under 0.5 mm : At finishing

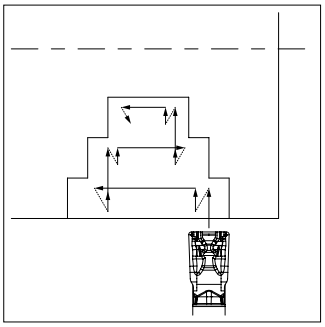


Fig.3

CP492-1 CAT/25T2411JPS