

Cutting Tools

2020-21



Aerospace Industry



Automotive Industry



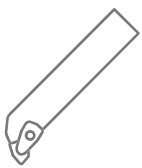
Medical Industry



Railway Industry



2020 ▶ 2021 KORLOY CUTTING TOOLS



Turning



Milling



Holemaking



Endmilling

CONTENTS

GRADES & CHIP BREAKERS

A Grades

A02 KORLOY grades system

Turning Grades

A04 Turning grade selections

A05 CVD coated grades

A15 PVD coated grades

A18 Uncoated Carbide grades

A20 Cermet grades

A23 Coated Cermet grades

Milling Grades

A26 Milling grade selections/CVD coated grades

A29 PVD coated grades

A37 Uncoated Carbide grades/Cermet grades

A Solid Endmills & Solid Drills

A39 Solid Endmills grade selections

A41 Solid Drills grade selections

Others (Turning/Milling/Endmills)

A43 Diamond coated grades

A44 DLC coated grades

A46 cBN inserts grades

A51 PCD inserts grades

Chip Breakers

A52 Chip Breaker for Turning

A56 Chip Breaker for Milling

A61 Chip Breaker for Drilling

TURNING

B Turning Chip Breakers

B02 Application range of KORLOY main
Chip Breakers

B04 Recommended Chip Breakers for workpiece

B12 Feature of Chip Breakers

Inserts

B26 Turning Insert Code System (ISO)

B28 Turning Insert (Negative)

B66 Turning Insert (Positive)

B90 Aluminum Insert (Positive)

B98 cBN Inserts

B102 PCD Inserts

Save Turn

B104 Technical Information for Save Turn

B105 Save Turn

Auto Tools

B111 Technical Information for Auto tools

B112 ISO/KHP/Blade/Multi Utility type

B127 KGT/MGT type

B130 MSB Tool

B136 Sleeve

Multi Turn

B137 Multi Turn

Bearing Solutions

B140 Technical Information for Bearing Solutions

B External Tool Holder

B148 External tool Holder

B153 Features of Double Clamp/Lever Lock system

B154 Double Clamp system

B159 Lever Lock System

B167 Wedge Clamp System

B169 Clamp on System

B171 Multi Lock System

B178 Screw on System

B185 Ceramic Holder

High Pressure Coolant

B187 KHP

Boring Bar

B191 Boring Bar

B195 Double Clamp System

B197 Lever Lock System

B201 Clamp on System

B202 Multi Lock System

B204 Screw on System

B214 Compact Mini

HSK/KM Tooling system

B217 Technical Information for HSK/KM Tooling System

B220 HSK Tooling system

B226 KM Tooling system

Cartridges

B230 Cartridges

B232 Clamp on System

B234 Screw on System

MULTI FUNCTIONAL TOOLS

C Application Example

- C02** Application Example
- C04** Technical Information for Multi Functional tools

KGT

- C07** KGT
- C24** KGT Blade for Parting off

KGT/MGT

- C25** MGT Series
- C38** KGT/MGT Cartridge

MGT Aluminum Wheel Series

- C42** MGT Aluminum Wheel

TB/TB-M

- C46** TB/TB-M

K Notch

- C54** K Notch

C Saw Man

- C59** Saw Man

Saw Man-X

- C62** Saw Man-X

Fine Tools

- C65** Technical Information for Fine Tools
- C66** Fine Tools Insert/Holder

Grooving/Parting off

- C68** IGH/DBH
- C69** GFIP
- C70** GH/GFIK
- C71** EH/PH

Special Order Form

- C72** Special Order Form for MGT
- C73** Special Order Form for V-Pulley Insert

THREADING

D Threading Code System

- D02** Threading Holder/Insert Code System

Technical Information for Threading

- D03** Technical Information for Threading
- D09** Threading Insert with Chip Breaker

Thread Inserts

- D10** Partial profile 60°/Partial profile 55°
- D12** ISO Metric
- D16** American UN
- D18** Whit Worth
- D22** British Standard Pipe Thread
- D22** National Pipe Thread
- D23** National Pipe Thread-Dry seal
- D23** Round DIN405
- D24** Trapez DIN103
- D24** American ACME
- D25** Stub ACME
- D26** UNJ (Unified Constant Thread)
- D28** American Buttress (ABUT)
- D28** British Buttress (BBUT)
- D29** Metric Buttress (SAGE)/API
- D30** API Buttress Casing (BUT)
- D30** API Round Casing & Tubing (APIRD)
- D30** Extreme Line Casing (EL)

D Thread Holders

- D31** External/Internal Holder
- D33** Vertical Type Holder

Thread Milling

- D34** Technical Information for Thread Milling
- D44** Thread Milling Insert
- D49** Thread Milling Holder

Solid Threading Endmills

- D50** Solid Threading Endmills

Tap

- D61** Technical Information for Tap
- D65** Carbide Tap
- D69** HSS Tap

CONTENTS

MILLING

E Insert

- E02** Milling Insert Code System (ISO)
- E04** Milling Inserts
- E32** KORLOY Cutters
- E38** KORLOY Shanks
- E42** KORLOY Modular Adaptors

Face Milling Cutters

- E44** Mill-max/Mill-max Plus (E45, E51)
- E54** Mill-max Heavy
- E56** Turbo Mill
- E59** Double Mill
- E61** Power Buster
- E68** Rich Mill
- E132** Technical Information for Aero Mill/
Aero Mill-Plus/Aero Mill-Mini
- E141** PCD face cutter

Cutters for Molds

- E142** Alpha Mill-X
- E147** Alpha Mill
- E183** BT/HSK Tooling System
- E184** BT Tooling System (Single-edge)
- E189** HSK Tooling System (Single-edge)
- E194** BT Tooling System (Multi-edge)
- E200** HSK Tooling System (Multi-edge)
- E205** BT Tooling System (Modular)
- E206** HSK Tooling System (Modular)
- E207** Technical Information for
Future Mill/FMR P-Positive
- E222** Future Mill
- E248** Future Mill P-Positive
- E260** HFMD
- E268** HFM
- E276** HRMDouble
- E292** HRM
- E299** Tank Mill
- E300** TP2P
- E309** Laser Mill/GBE/BRE

E Cutters for Molds

- E329** Technical Information for HAVE
- E331** HAVE (Single-edge/Multi-edge)
- E333** O-ring Cutter
- E335** Chamfer Tool (Multi-functional, Solid)

Milling Cutter for Aluminum

- E344** Technical Information for Pro-A Mill/
Pro-X Mill/Pro-L Mill/Pro-XL Mill/Pro-V Mill
- E354** Pro-A Mill
- E357** Pro-X Mill
- E363** Pro-L Mill
- E367** Pro-XL Mill
- E368** Pro-V Mill
- E371** Modular Adaptor (MAT)

Side Milling Cutters

- E373** Technical Information for Side Milling Cutters
- E375** Side Milling Cutters
- E379** Side Cutter
- E382** Wind Mill

Milling Cutter for Cast iron at high feed

- E386** Technical information for High feed Cutter
- E388** Technical information for Cube Mill/Couple Mill
- E391** Technical information for Storm Mill
- E392** Technical information for Shave Mill/Shave Mill-Ultra
- E395** High feed Cutter
- E397** Shave Mill/Shave Mill-Ultra

Detail Information of Milling Cutter and Arbor

- E400** Actual Designation of Milling Cutter and Arbor

Gear Tools

- E403** Gear Cutter
- E413** Gear Cutter Order Form
- E415** Indexable Hob Order Form
- E416** Special Boring Tool Order Form

ENDMILLS

F Technical Information for Endmills

- F02** Endmill Code System
- F04** KORLOY Endmills

Solild Endmills

- F09** H Endmill
- F14** V Endmill
- F17** Z Endmill
- F24** F Endmill

F Solild Endmills

- F27** T Endmill
- F30** D Endmill
- F37** Solid Endmills for Aluminum
- F40** C-Max
- F44** Super Endmill
- F51** Composite Router Endmill
- F57** I+ Endmill
- F72** Z+ Endmill

ENDMILLS

F Solid Endmills

- F89** S+ Endmill
- F92** R+ Endmill
- F103** A+ Endmill
- F114** PCD Endmill

F Brazed Endmills

- F116** Brazed Endmill

Special Endmill Order Form

- F123** Special Endmill Order Form

DRILL

G Technical Information for Drills

- G02** KORLOY Drills
- G04** Available Insert

Indexable Drills

- G06** King Drill
- G21** King Drill (for through coolant system with a lathe)
- G25** King Drill (for large diameter drilling)
- G27** TPDC
- G34** TPDB Plus
- G44** TPDB-H
- G51** Technical information for WPDC
- G54** Center Drill
- G55** WPDC

Solid Drills

- G57** Mach Solid Drill Plus
- G64** Mach Solid Drill Plus-S
- G70** Mach Solid Drill Plus CFRP

G Solid Drills

- G73** Mach Solid Flat Drill
- G82** Mach Long Drill Plus
- G87** Mach step Drills Order Form
- G88** Vulcan Drill
- G91** ESD Plus
- G98** Carbide Drill (SSDP)
- G101** Burnishing Drill
- G102** Top solid Drill
- G103** PCD Drill
- G104** Gun Drill

Reamer

- G110** Indexable Reamer
- G116** Chucking/Machine Reamer
- G119** PCD Reamer
- G120** Cermet Reamer
- G121** Broach Reamer

BRAZED TOOLS

H Technical Information for Brazed Tools

- H02** KORLOY Ultra-Fine Grades: F-Series
- H03** Corrosion & Magnetism Proof Grade: IN-Series

General Cutting tools

- H04** Cemented Carbide, Cermet Blank
- H07** Round bar Blank/Ring Blank
- H08** Helix Blank/Square Bits
- H10** Auto Tool Bits
- H11** Chuck Jaw

H Technical Information for Brazed Tools

- H12** Cemented carbide blank for taper bits
- H13** Cemented carbide blank for cross bits
- H13** Taper bits
- H13** Boring Crown Blank/Bit for Construction

Rotating Brazing Tools

- H14** Rotating Brazing Tool
- H15** Special Rotating Brazing Tool Order Form

TOOLING SYSTEM

I Tooling System

- I 02** DBT Series
- I 03** HSK Tooling System
- I 04** Balancing System
- I 05** Tooling System Index
- I 06** DHE Series
- I 09** DSC Series
- I 17** CPM Series

I Tooling System

- I 19** NPM Series
- I 21** DCS/DC/TC
- I 22** Collet Chuck Series
- I 24** SDC Series
- I 29** GSK Series
- I 31** DSK Series

CONTENTS

TOOLING SYSTEM

I Tooling System

- I 34 GERC
- I 37 DST Series
- I 39 NPU
- I 40 DTN Series
- I 42 TCA/TER
- I 44 Side Lock Arbor Series
- I 46 Face Mill Arbor Series
- I 49 Angular Head Series

I Tooling System

- I 57 FBH Series
- I 61 TBC/FBC Series
- I 65 DBC/KMB
- I 67 SMB/SMH
- I 69 Modular System/Modular Arbor
- I 72 EXT Bar/RDC Bar
- I 74 DAMPING PRO
- I 81 Others

TOOLING EXAMPLES

J Industrial Tooling Example

- J02 Gear Machining Solution
- J04 Ship Building Industrial Solution
- J07 Role Machining Solution
- J08 Railway Industrial Solution
- J10 Pipe Industrial Solution
- J12 Bearing Working Solution
- J13 Development Industrial Solution
- J14 Aviation Industrial Solution
- J18 Slitter Knife

J Automobile Tooling Examples

- J19 Crankshaft
- J20 Knuckle
- J22 Brake
- J24 Connecting Rod
- J26 Block
- J28 Head

PARTS

K Parts

- K02 Shim
- K03 Cartridge/Chip Breaker
- K03 Chip Cover/Clamp
- K04 Coolant Bolt/Wrench Bolt
- K04 Lever
- K05 Locator/Nut

K Parts

- K05 Pin/Screw
- K06 Shim Pin
- K07 Spring/Wrench
- K07 Stop Ring/Washer
- K07 Stopper/Nozzle

TECHNICAL INFORMATION

L General Information I

- L02 Workpiece material grades
- L06 Steel, Non-ferrous metal symbol list
- L07 SI unit conversion table
- L08 Hardness calculating table
- L09 Properties of Korloy grades

L Technical Information

- L20 Technical Information for Milling
- L24 Technical Information for Tapers
- L27 Technical Information for Endmills
- L30 Technical Information for Drills

Technical Information

- L10 Technical Information for Turning

General Information II

- L36 The comparison of chip breakers
- L37 KORLOY Grades
- L40 The comparison of grades for Turning/Milling

OLD-FASHIONED PRODUCT INFORMATION

M Old-fashioned product information

- M02 Grade
- M02 External Holder
- M03 Fine Tool
- M03 Threading Tool

M Old-fashioned product information

- M02 Mill-Max
- M02 Gen-Mill
- M03 Jip Drill
- M03 LPD/SPD/NPD

INDEX

N Index

SAFETY GUIDE OF CARBIDE PRODUCTS

KORLOY Inc. is continuously trying to develop safer and higher quality products
Please be aware of the safety guidelines below prior to using KORLOY Inc. products

- It is generally accepted that the proper handling of cemented carbide tools requires awareness of safety as noted above. For more information, please contact us.
- KORLOY does not accept any responsibility for any accident caused by inappropriate use, abuse of tools, or changes to the products.

1. PL (Product Liability)

In accordance with the PL (Product Liability) law, we have attached a WARNING label on the case of KORLOY products. There is no warning on the surface of the tools. Please read this safety guidelines before using carbide tools and provide safety education to all users.

2. Basic characteristics of CEMENTED CARBIDE tools

Cemented carbide tools are made of carbides, nitrides, carbonitrides, oxides of Tungsten (W), Titanium (Ti), Alluninyum (Al), Silicon (Si), Tantalum (Ta), Boron (B) etc and metal omponent like Cobalt (Co), Nickel (Ni), Chrom (Cr), Molybdenum (Mo) as binder. Cemented carbides tools have high hardness and specific gravity. Generally there's no smell but according to usage and treatment, appreance and color could be changed

3. Precaution for CEMENTED CARBIDE tools

- 1) Cemented carbides are extremely hard and brittle at the same time. Impact shock or excessive clamping power could cause fracture or breaking of the tool.
- 2) Cemented carbides have large sepcific gravity, thus they require special attention as a heavy material when you handle big sizes or large quantities.
- 3) Cemented carbides have different thermal expansion coefficient with steel and ferrous materials. Shrink fit or swell fit products may cause trouble if they are used at undesirable conditions like extremly high or low temperatures.
- 4) There are several cemented carbide products having sharp cutting edges.Be careful not to handle the tools with bare hands which may cause cuts or injury, especially when removing the tools from the case, do not touch the cutting edge and be careful not to drop it.
- 5) Storing carbide tools in a corrosive atmosphere may cause erosion which can reduce toughness.
- 6) Please refer to the catalouge safety guidance prior to handling the tools.
- 7) Do not absue tools under inappropriate conditions.

4. Precaution for machining (grinding, welding, EDM) of CEMENTED CARBIDE tools

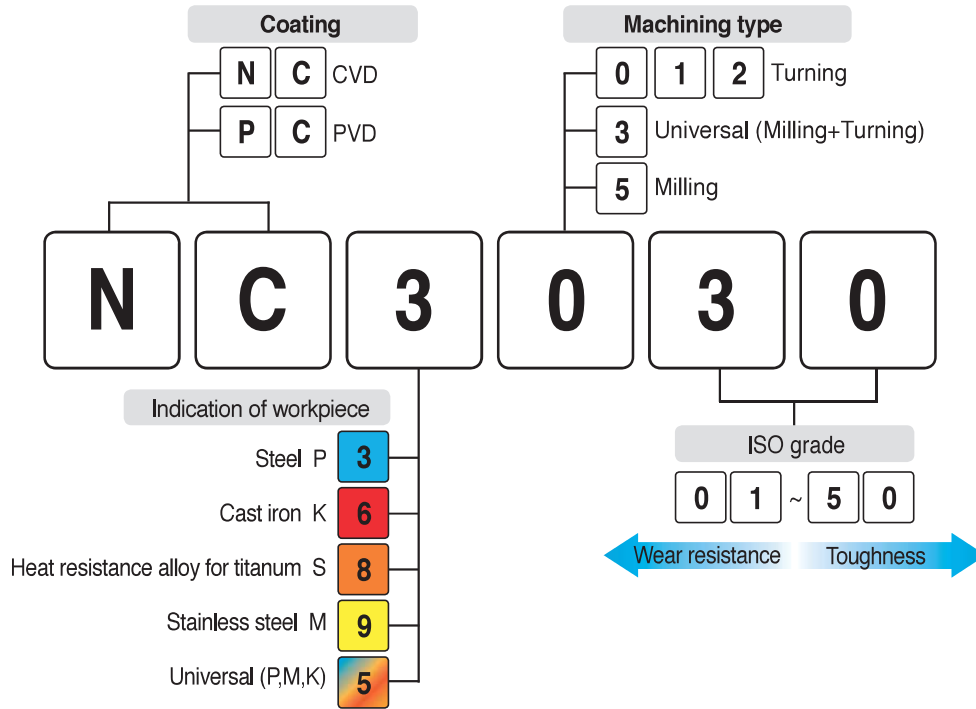
- 1) Surface condition can affect the toughness of the tool, so it is recommended to use a diamond grinding wheel.
- 2) Grinding of cemented carbide creates mist and dust. It contains harmful compositions like Cobalt (Co), thus it is recommended to use a mask, mist collection, and other protective facilities. If the dust gets in your skin or eye, rinse immeditely with continuously running water.
- 3) In case of grinding with coolant, coolant contains harmful metal components which cause environmental problems. Handle the coolant according to the manufacturer's recommendations.
- 4) Check for cracks after re-grinding carbide tool and reuse.
- 5) Marking with laser or electric pen may cause cracks on the carbide tool. The crack can shortened tool life.
- 6) EDM of carbide may cause residual cracks on the carbide tool, so if necessary , remove the crack with a grinding process.
- 7) Brazing of carbide tools at extremly high or low temperatures compare with the melting point of brazing materials may cause loosening or breakage.
- 8) Overheating a oil base coolant may cause a fire or flames, thus be prepared for fire prevention.

5. METALCUTTING SAFETY

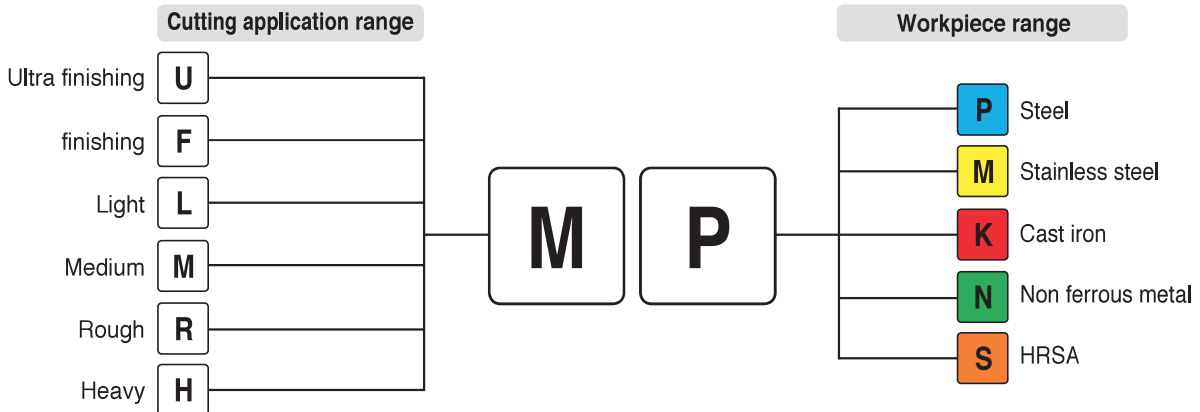
	DAINGEROUS FACTOR	SAFETY COUNTERPLAN
Cutting tools	• Sharp cutting edge of cutting tools may cut your bare-hand	• Use gloves when pulling out the insert from the case or mounting it on the machine
	• Inappropriate conditions or usage may cause fragmentation and expel parts of tools which may cause injury	• Use glasses or safety cover for your safety • Use the tools within the recommended range • Please refer to catalogue and safety guidelines first
	• Severe load on tool and premature wear of cutting edge may bring excessive cutting force on tool, causing fracture of the tool and may cause injury	• Use glasses or safety cover for your safety • Change the tool as required before excessive wear or fracture
	• Chips evacuated during cutting are hot and sharp and maycause burns and cuts	• Use glasses or safety cover for your safety • Stop machining and put safety glove on and use a hook tool to remove chips
	• Touching the workpiece immediately after cutting may cause burns	• Use gloves or safety cover for your safety
	• Be aware of sparks, fire, or explosion of hot chips generated during the cutting operation	• Do not use at the place where having explosive materials • Prepare for fire extinguishments
	• In case of high RPM machining, vibration and chattering may occur due to the improper balance of the machine	• Use glasses or safety cover for your safety • Check first if there's any chattering, vibration or strange noises prior to your main cutting operation
	• Touching a burr remaining on the workpiece with a bare-hand may cause a cut	• Do not touch the burr with bare-hand • Use gloves or safety cover for your safety
	• Loose clamping of the workpiece may cause the tool to fracture and result in damage to the cutter body and possible injury	• Clamp the workpiece tightly
	• Tools are operated to right-hand direction normally • Left-hand direction operation can cause fracture of tool and body damage	• Do not use left-hand direction without notice • Check the package of product to check the availability of left-hand operation
Indexable tools	• Loose clamping of inserts and parts may result in ejection of the tool during cutting and may cause serious injury	• Check the clamping of inserts and parts prior to machining, and use original parts only
	• Over loaded clamping of inserts by a lever (such as a pipe) may cause dangerous fracturing of parts and inserts	• Do not use lever inappropriately
	• In case of high speed machining, parts and inserts can be forced out by centrifugal force	• Use within recommended condition • Use glasses or safety cover for your safety
Rotating tools	• Since cutter has sharp cutting edges touching with a bare-hand may cause a cut	• Use gloves or safety cover for your safety
	• It is dangerous to use glove with rotating machine • Contact with body or clothes is dangerous with rotating parts	• Do not wear gloves when you work with rotating machine • Keep your body and clothes away from rotating machine
	• Vibration generated by balancing trouble may cause a fracture and ejection of the tool which may cause serious injury	• RPM should be controled within recommended condition • Check the balance of rotating part periodically
	• In case of drilling, the uncut bottom core can fly out of the part with high speed and cause serious injury	• Use gloves or safety cover for your safety
	• The edges of small diameter drill are sharp and easy to break	• Use gloves or safety cover for your safety
Brazed tools	• Fragmentation and ejection of brazed carbide tip may cause injury	• Check the brazed tip before using • Do not use at high temperature cutting condition
	ETC	• There's a possibility of breaking the carbide tip after several brazing • Abusing may cause fragmentation of tool and is very dangerous
		• Do not use brazing a tip that has been brazed several times • Stick to safety regulations and guidelines

KORLOY Inc. Code System

Grade name for coated carbide



Chip breaker



The same chip breaker code is used for both negative type and positive type.

Terminology of tool formula

TERM	CODE	UNIT
Tool diameter	D	mm
Cutting speed	vc	m/min
Revolution per minute	n	min ⁻¹
Feed per minute	vf	mm/min
Feed per revolution	fn	mm/rev
Feed per tooth	fz	mm/t
Tooth	z	
Axial depth of cut	ap	mm
Radial depth of cut	ae	mm
Peak feed	pf	mm

TERM	CODE	UNIT
Horse power requirement	Pc	kW
Specific cutting resistance	kc	MPa
Torque	Mc	N.m
Thrust	Tc	N
Cycle time	tc	min
Tool life	T	min
Flank wear	V _B	mm
Crater wear	Kt	mm
Nose radius	r	mm

