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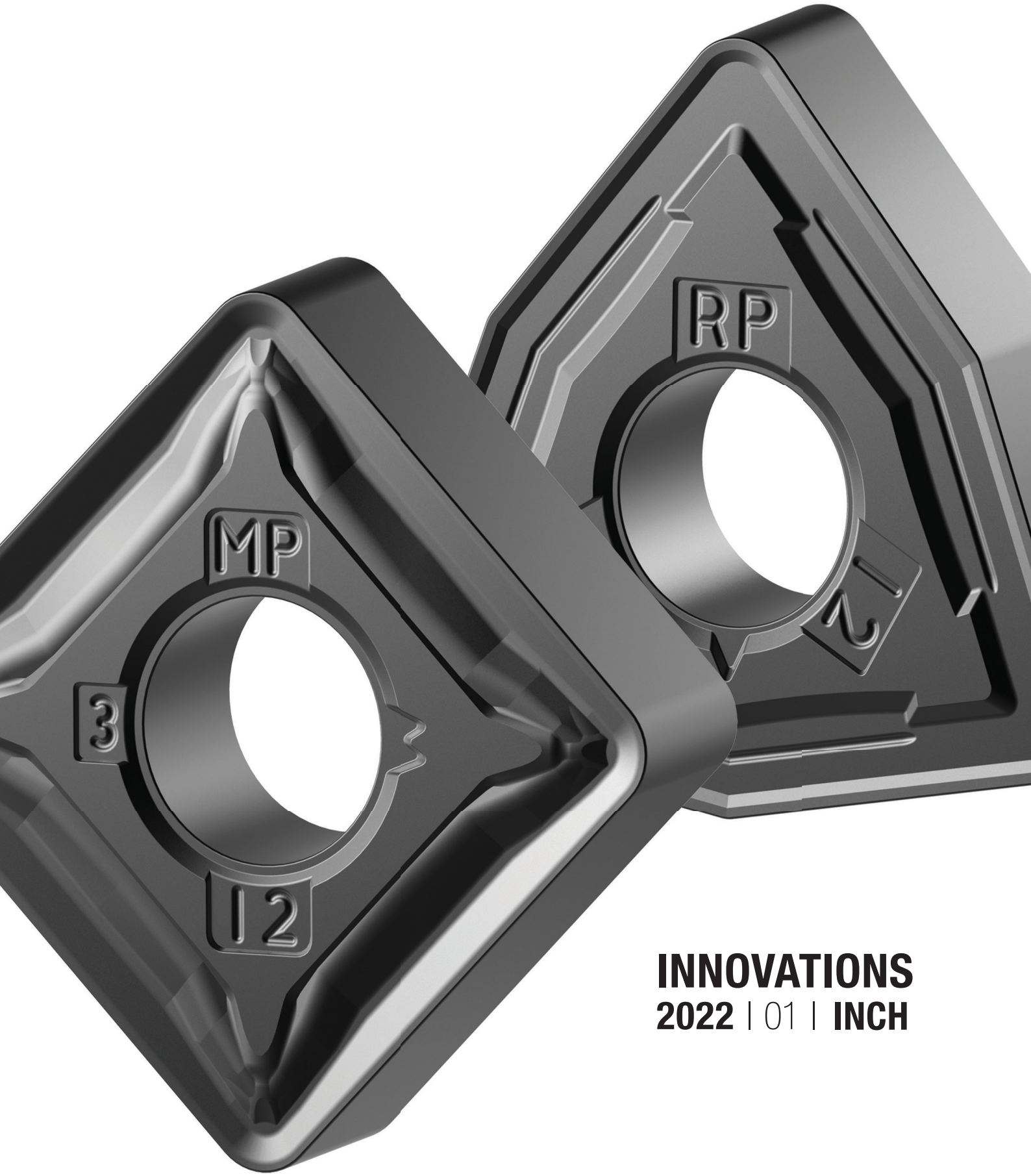

INNOVATIONS

2022 | 01 | **INCH**

KCS10B™

Turning Grade for
High-Temperature Alloys

New High-PIMS PVD coating provides excellent surface qualities and excellent dimensional accuracy.

High depth-of-cut notching resistance.

New High-PIMS PVD coating reduces friction, providing longer tool life.

INNOVATIONS

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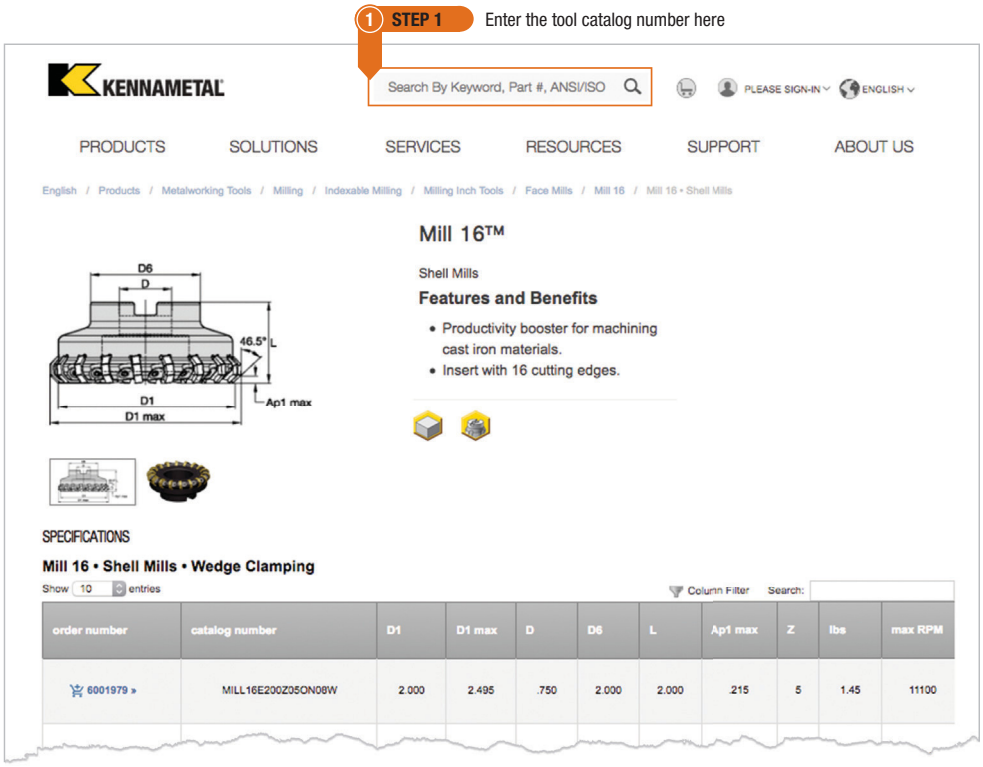
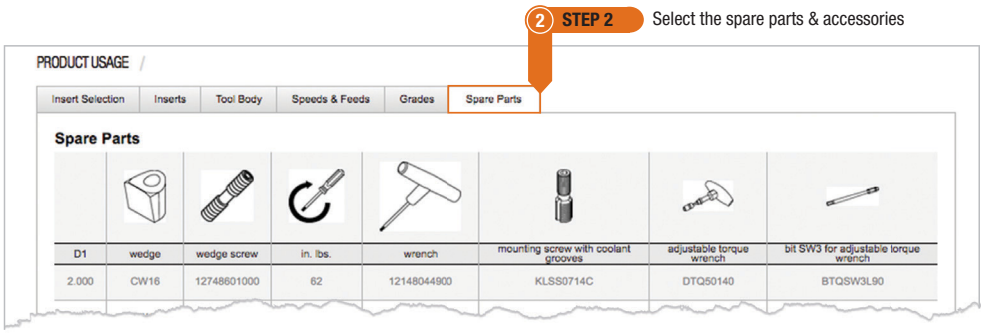
Visit kennametal.com to find local Authorized Kennametal Distributors.

Spare Parts & Accessories Information

Lost a screw? Have to replace worn-out clamping wedges?
Need to find and re-order those spare parts?

Are you in need of some accessories, like a torque wrench or coolant shower plate? These tools are at your fingertips!
Go to **kennametal.com** and find what you need in seconds. Enter the catalog number of the corresponding tool, and it will display.





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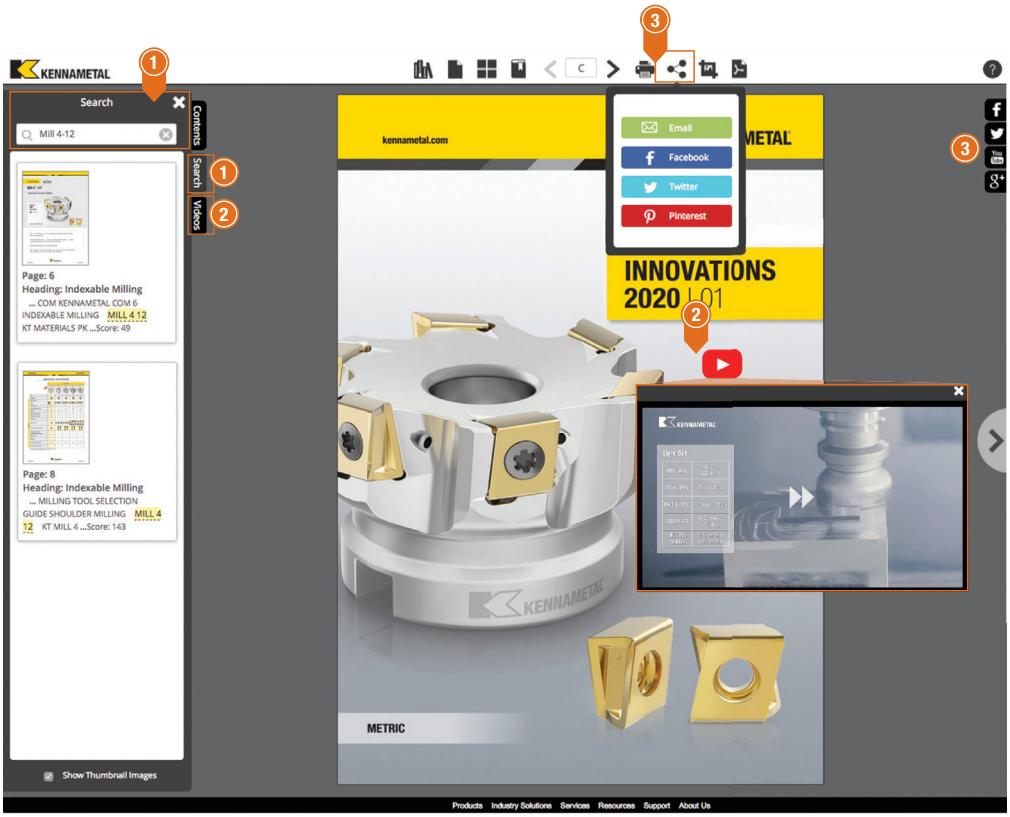

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POWERED BY NOVO

KCS10B™

Turning Grade for High-Temperature Alloys

Materials

S

Applications

- Turning
- Facing
- Boring
- I.D. Facing
- Back Boring
- Chamfer Turning
- Profiling
- Deep Grooving

kennametal.com/KCS10B

The new KCS10B turning grade, featuring the new High-Power Impulse Magnetron Sputtering (High-PIMS).

The AlTiN PVD coating is ideal for iron-based alloys (S1), cobalt-based alloys (S2), and nickel-based alloys (S3).

The High-PIMS coating technology is characterized by:

- Smooth coating surface.
- Optimum layer adhesion, especially on sharp cutting edges.
- High depth-of-cut notching resistance.
- Long tool life and high process reliability.

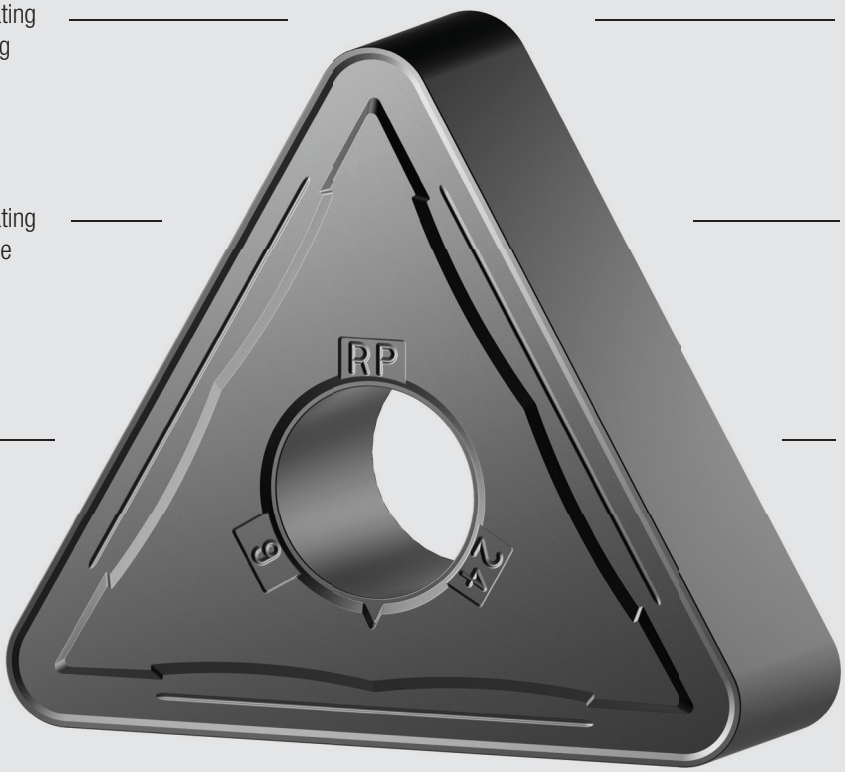
Applied on an extremely hard and wear-resistant, ultra fine-grain carbide substrate, the KCS10B grade is ideal for medium machining and finishing operations.

KENNAMETAL

New High-PIMS PVD coating reduces friction, providing longer tool life.

New High-PIMS PVD coating provides excellent surface qualities and excellent dimensional accuracy.

Less built-up edge.

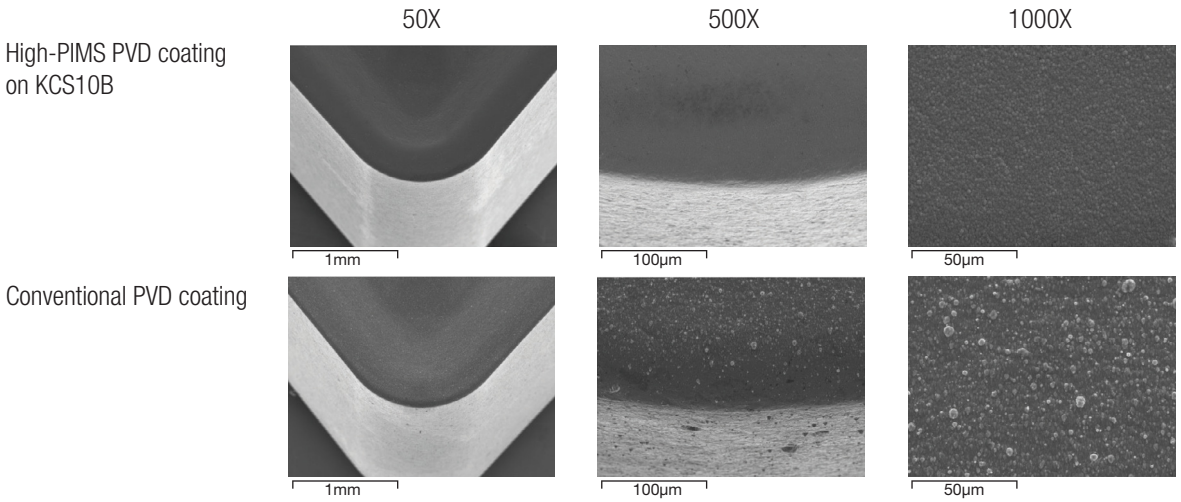


An extremely smooth coating surface reduces friction, providing longer tool life and increased process reliability.

NEW!
RP Geometry for roughing.

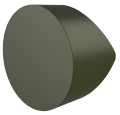
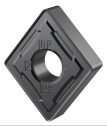
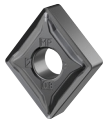
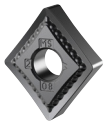
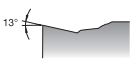
NEW!
IC 6 inserts available now.

The High-PIMS AlTiN PVD coating under the microscope.



ISO Carbide Inserts

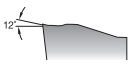
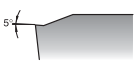
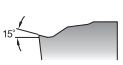
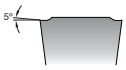
HIGH-TEMPERATURE ALLOYS • TOOL SELECTION GUIDE

	Ceramic Inserts		Negative Inserts Geometry				
	NG	GV	RP	MP	MS	FP	FS
Geometry							
Profile							
Edge Preparation							
T-Land	✔						
Honed		✔	✔	✔		✔	
Slightly Honed to Sharp					✔		
Sharp							✔
Application							
Roughing	✔	✔	✔				
Light Roughing	✔	✔	✔	✔			
Medium Machining				✔	✔		
Semi-Finishing					✔	✔	✔
Finishing						✔	✔
Cutting Condition							
Heavily Interrupted Cut	●		●				
Lightly Interrupted Cut	●	●	●	●	○	○	
Varying Depth of Cut, Casting or Forging Skin	●	●	●	●	●	●	●
Smooth Cut, Pre-Turned Surface	●	●		●	●	●	●

● Primary
○ Secondary

ISO Carbide Inserts

HIGH-TEMPERATURE ALLOYS • TOOL SELECTION GUIDE

	Positive Inserts Geometry					
	MP	**MP V-Bottom**	**MS**	**LF**	**FP**	**K-Lock FS**
Geometry						
Profile						
Edge Preparation						
T-Land						
Honed	✔	✔				
Slightly Honed to Sharp			✔	✔	✔	
Sharp						✔
Application						
Roughing						
Light Roughing	✔	✔				
Medium Machining	✔	✔				
Semi-Finishing			✔	✔	✔	✔
Finishing			✔	✔	✔	✔
Cutting Condition						
Heavily Interrupted Cut						
Lightly Interrupted Cut	●	●	○	○	○	
Varying Depth of Cut, Casting or Forging Skin	●	●	●	●	●	●
Smooth Cut, Pre-Turned Surface	●	●	●	●	●	●

● Primary
○ Secondary

ISO Carbide Inserts

HIGH-TEMPERATURE ALLOYS • APPLICATION DATA • FEED

Insert with positive rake angle

	Geometry				
Conditions	**FS**	**FP**	**LF**	**MS**	**MP**
Heavily Interrupted Cut					
Lightly Interrupted Cut		○	○	●	●
Varying Depth of Cut	●	●	●	●	●
Smooth Cut	●	●	●	●	●

Min. - Max.	**FS**	**FP**	**LF**	**MS**	**MP**
Depth of Cut - ap (in)	.003-.197	.003-.098	.003-.098	.019-.197	.015-.197
Depth of Cut - ap (mm)	0,1-5	0,1-2,5	0,1-2,5	0,5-5	0,4-5
Feed - fn (in/rev)	.001-.015	.001-.003	.002-.015	.005-.031	.003-.023
Feed - fn (mm/rev)	0,04-0,4	0,05-0,3	0,06-0,4	0,15-0,8	0,1-0,6

Insert with negative rake angle

	Geometry				
Conditions	**FS**	**FP**	**MS**	**MP**	**RP**
Heavily Interrupted Cut					○
Lightly Interrupted Cut		○	○	●	●
Varying Depth of Cut	●	●	●	●	●
Smooth Cut	●	●	●	●	●

Min. - Max.	**FS**	**FP**	**MS**	**MP**	**RP**
Depth of Cut - ap (inch)	.003-.098	.007-.137	.011-.216	.023-.236	.039-.512
Depth of Cut - ap (mm)	0,1-2,5	0,2-3,5	0,3-5,5	0,6-6	1-13
Feed - fn (in/rev)	.001-.009	.003-.013	.003-.017	.004-.023	.007-.035
Feed - fn (mm/rev)	0,04-0,25	0,08-0,35	0,08-0,45	0,12-0,6	0,2-0,9

HIGH-TEMPERATURE ALLOYS • APPLICATION DATA • SPEED

Iron-Based, Heat-Resistant Alloys (135–320 HB) (<34 HRC) — Speed — m/min (SFM) — Starting Conditions

material group	grade	15 (50)	45 (150)	75 (250)	105 (350)	140 (450)	170 (550)	200 (650)	230 (850)	m/min	SFM
S1	KCS10B			◁▷						80	260

Cobalt-Based, Heat-Resistant Alloys (150–425 HB) (<45 HRC) — Speed — m/min (SFM) — Starting Conditions

material group	grade	15 (50)	45 (150)	75 (250)	105 (350)	140 (450)	170 (550)	200 (650)	230 (850)	m/min	SFM
S2	KCS10B		◁▷							50	165

Nickel-Based, Heat- Resistant Alloys (140-475 HB) (<48 HRC) — Speed — m/min (SFM) — Starting Conditions

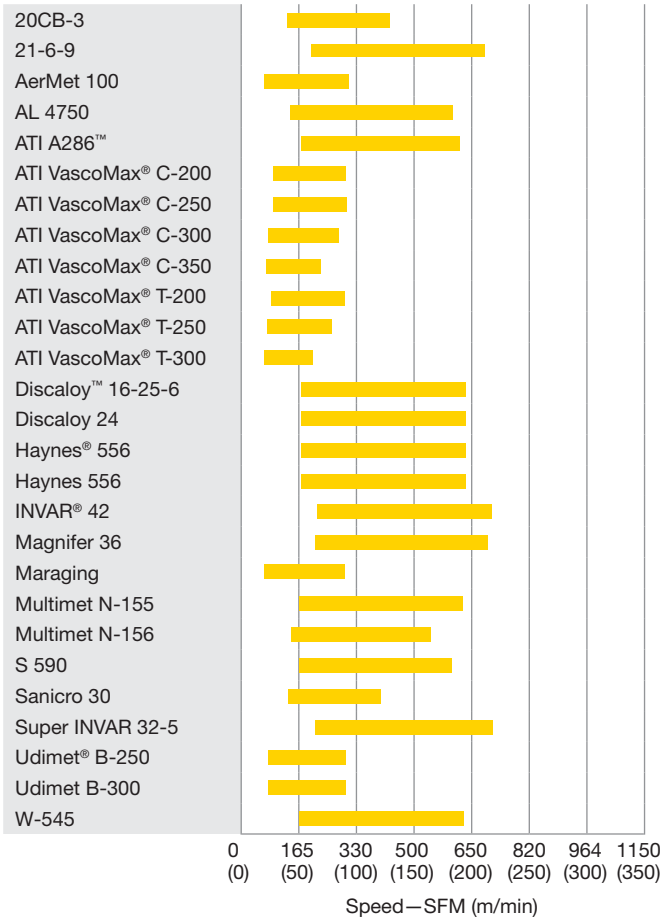
material group	grade	15 (50)	45 (150)	75 (250)	105 (350)	140 (450)	170 (550)	200 (650)	230 (850)	m/min	SFM
S3	KCS10B			◁▷						70	230

ISO Carbide Inserts

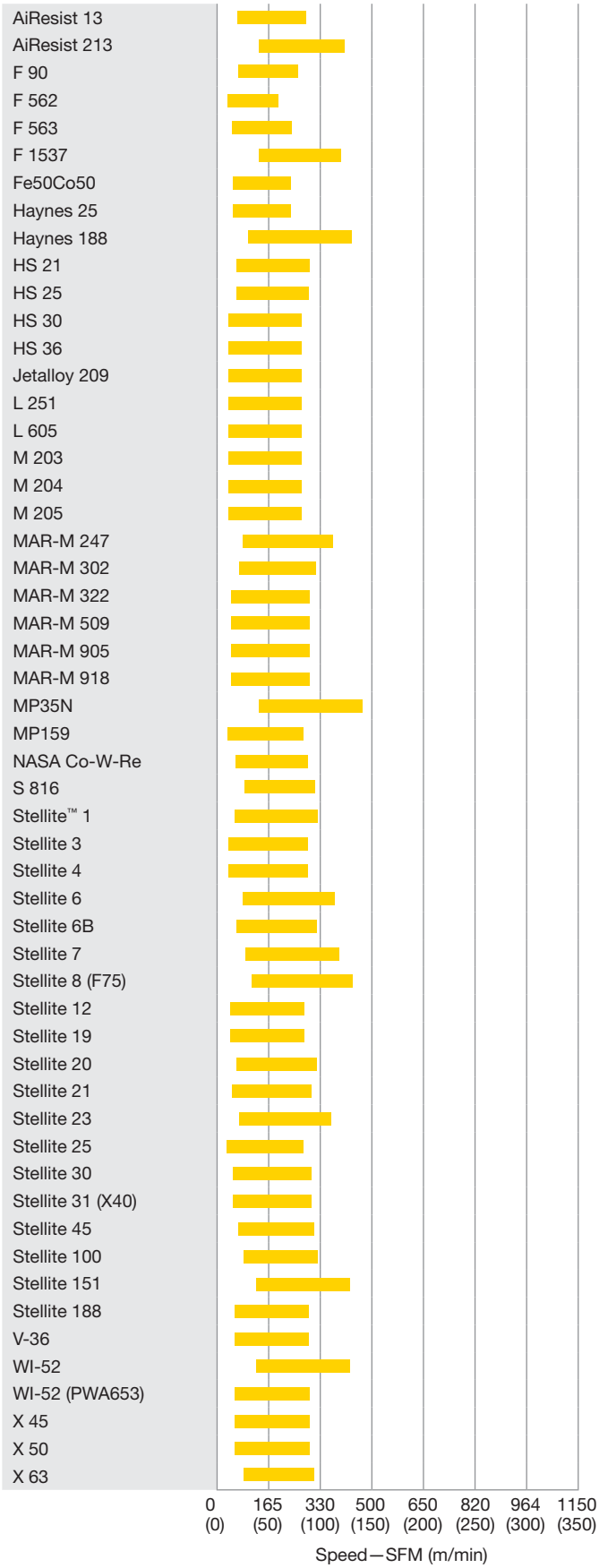
HIGH-TEMPERATURE ALLOYS • APPLICATION DATA

S1 Iron-Based, Heat-Resistant Alloys (135–320 HB) (≤34 HRC)

The most common HRSA alloys



S2 Cobalt-Based, Heat-Resistant Alloys (150–425 HB) (≤45 HRC)

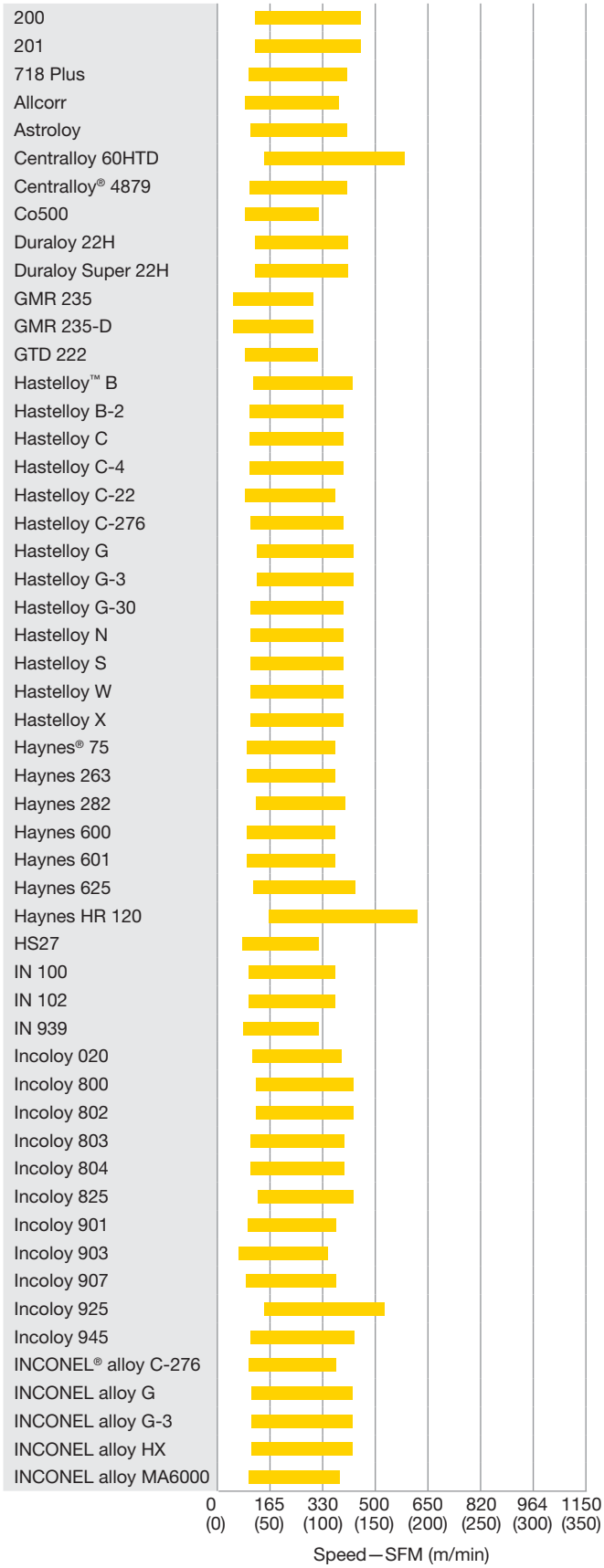


ISO Carbide Inserts

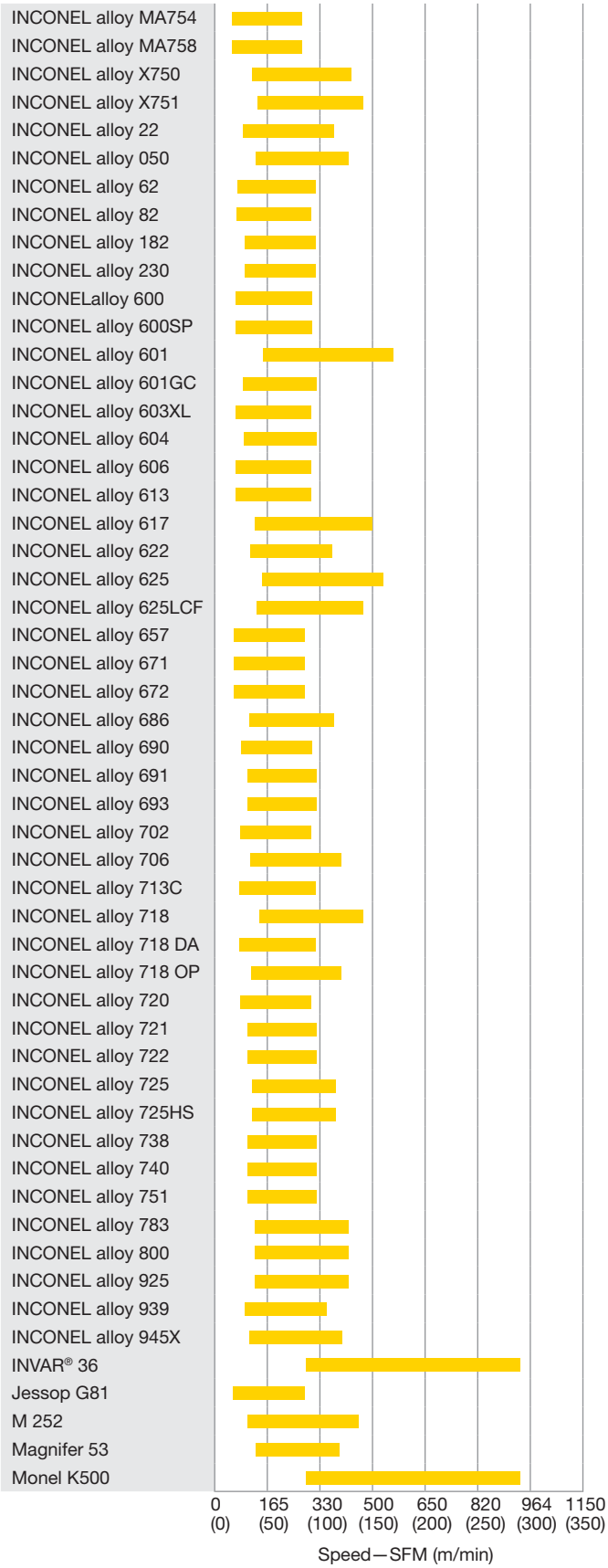
HIGH-TEMPERATURE ALLOYS • APPLICATION DATA

(continued)

S3 Nickel-Based, Heat-Resistant Alloys (140–475 HB) (≤48 HRC)



S3 Nickel-Based, Heat-Resistant Alloys (140–475 HB) (≤48 HRC)

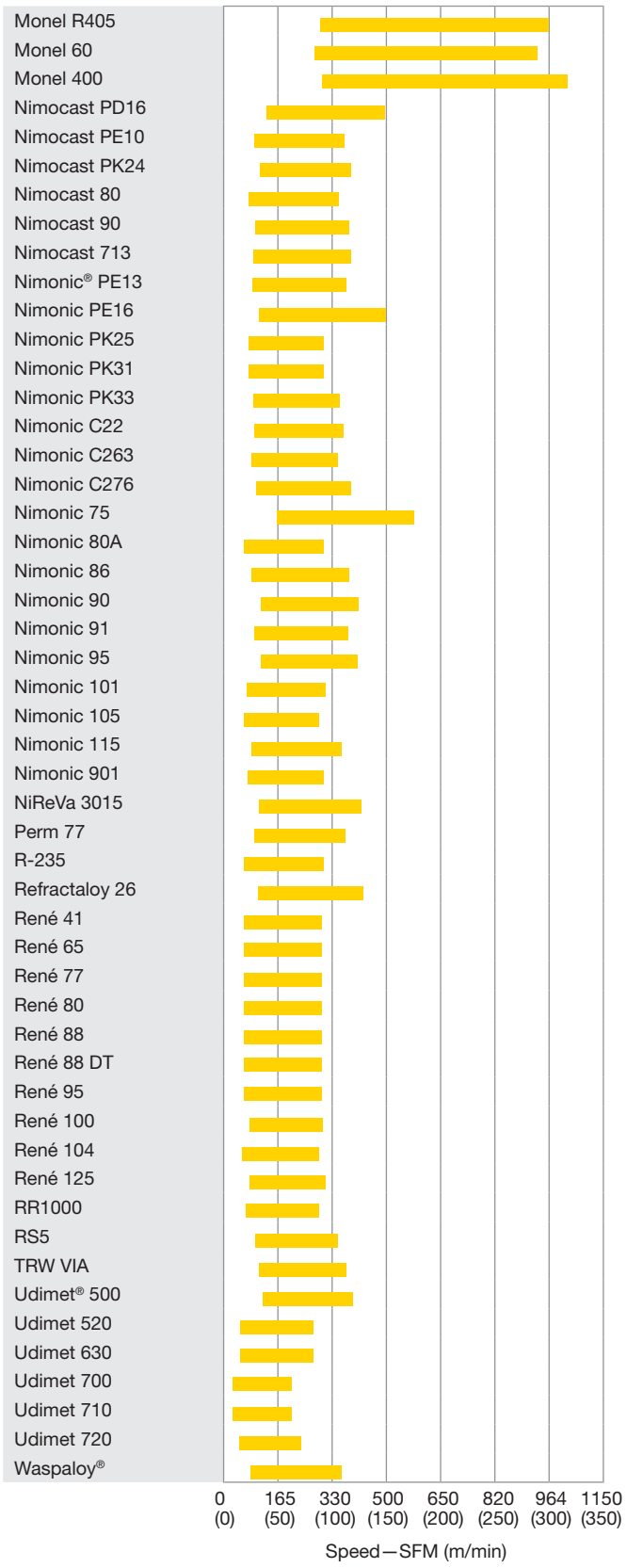


ISO Carbide Inserts

HIGH-TEMPERATURE ALLOYS • APPLICATION DATA

(continued)

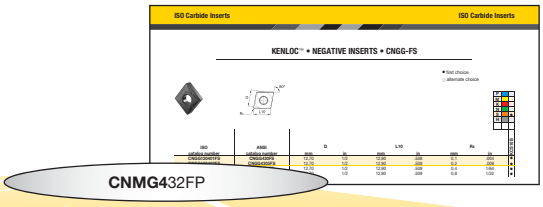
S3 Nickel-Based, Heat-Resistant Alloys (140–475 HB) (≤48 HRC)



ISO Carbide Inserts

ISO INSERTS • CATALOG NUMBERING SYSTEM

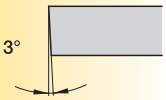
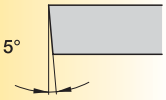
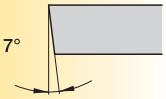
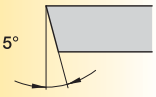
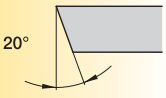
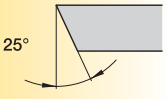
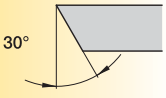
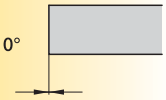
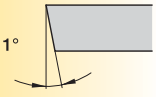
Each character in our catalog number signifies a specific trait of that product.
Use the following key columns and corresponding images to easily identify which attributes apply.



C — Insert Shape

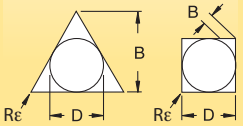
H	Hexagon 120°	
O	Octagon 135°	
P	Pentagon 108°	
R	Round —	
S	Square 90°	
T	Triangular 60°	
C D E M V	Rhomboid 80° 55° 75° 86° 35°	
W	Trigon 80° with enlarged corner angles	
L	Rectangular 90°	
A B N/K	Parallelogram 85° 82° 55°	

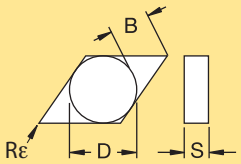
N — Insert Clearance Angle

A	3°	
B	5°	
C	7°	
D	15°	
E	20°	
F	25°	
G	30°	
N	0°	
P	11°	
O	Indicated for other clearance angles requiring descriptions.	

M — Tolerance Class

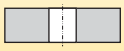
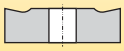
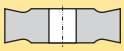
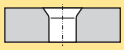
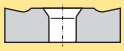
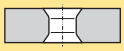
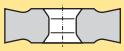
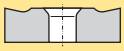
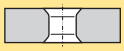
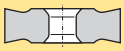
Tolerances apply prior to edge prep and coating.





D = Theoretical diameter of the insert inscribed circle
S = Thickness
B = See figures below

G — Insert Features

N	
R	
F	
A	
M	
G	
W	
T	
Q	
U	
B	
H	
C	
J	
X	Special Design

4 — Size

Code for inch cutting edge length "L10"

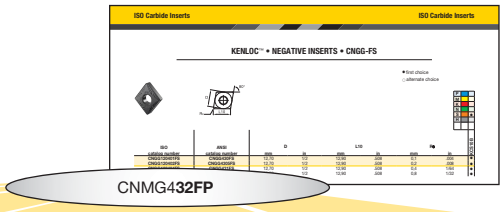
inch	"D" inch	C	D	R	S	T	V	W
1.2 (5)	5/32	S4	04	03	03	06	—	—
1.5 (6)	3/16	04	05	04	04	08	08	S3
1.8 (7)	7/32	05	06	05	05	09	09	03
—	.236	—	—	06	—	—	—	—
2	1/4	06	07	06	06	11	11	04
2.5	5/16	08	09	07	07	13	13	05
—	.315	—	—	08	—	—	—	—
3	3/8	09	11	09	09	16	16	06
—	.394	—	—	10	—	—	—	—
3.5	7/16	11	13	11	11	19	19	07
—	.472	—	—	12	—	—	—	—
4	1/2	12	15	12	12	22	22	08
4.5	9/16	14	17	14	14	24	24	09
5	5/8	16	19	15	15	27	27	10
—	.630	—	—	16	—	—	—	—
5.5	11/16	17	21	17	17	30	30	11
6	3/4	19	23	19	19	33	33	13
—	.787	—	—	20	—	—	—	—
7	7/8	22	27	22	22	38	38	15
—	.984	—	—	25	—	—	—	—
8	1	25	31	25	25	44	44	17
10	1-1/4	32	38	31	31	54	54	21
—	1.260	—	—	32	—	—	—	—

tolerance class	tolerance on "D"	tolerance on "B"	tolerance on "S"
C	±.0010"	±.0005"	±.001"
H	±.0005"	±.0005"	±.001"
E	±.0010"	±.0010"	±.001"
G	±.0010"	±.0010"	±.005"
M	See tables on next page		±.005"
U	See tables on next page		±.005"

ISO Carbide Inserts

ISO INSERTS • CATALOG NUMBERING SYSTEM

(continued)



3	2			FP
Thickness S	Corner Radius "Rε"	Hand of Insert *(optional)*	Cutting Edge *(optional)*	Chipbreaker *(optional)*

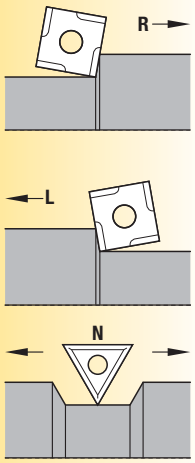
symbol inch	thickness inch
.5 (1)	1/32
.6	.040
1 (2)	1/16
1.2	5.64
1.5	3/32
2	1/8
2.5	5/32
3	3/16
3.5	7/32
4	1/4
5	5/16
6	3/8
7	7/16
18	1/2

symbol inch	corner radius inch
X0	.0015
0	.004
.5	.008
1	1/64
2	1/32
3	3/64
4	1/16
5	5/64
6	3/32
7	7/64
8	1/8
—	round insert
—	

R = Right hand

L = Left hand

N = Neutral



F Sharp

E Rounded

T Chamfered

S Chamfered and Rounded

K Double-Chamfered

P Double-Chamfered and Rounded

F = Sharp

FF = Fine Finishing

FN = Finishing Negative

MN = Medium Negative

MR = Medium Roughing

RN = Roughing Negative

UN = Universal Medium

FP = Finishing Positive

MP = Medium Positive

RP = Roughing Positive

RM = Roughing Medium

RH = Roughing Heavy

FW = Finishing Wiper

MW = Medium Wiper

FS = Finishing Sharp

MS = Medium Sharp

RW = Roughing Wiper

HP = High Positive

UP = Universal Positive

K = Light-Feed Chip Control

UF = Ultra-Fine Finishing

LF = Light Finishing

MF = Medium Finishing

E = Hone Only

T = Negative Land

S = Negative Land Plus Hone

MP-K = Medium Positive

MG-P = Medium Positive

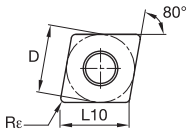
"D" inch	± Tolerance on "D" Class M Tolerance Shapes S, T, C, R, & W inch	Class M Tolerance Shape D inch	Class M Tolerance Shape V inch	Class U Tolerance Shapes S, T, & C inch
5/32	.002	–	–	–
3/16	.002	–	–	.003
7/32	.002	.002	.002	.003
1/4	.002	.002	.002	.003
5/16	.002	.002	.002	.003
3/8	.002	.002	.002	.003
7/16	.003	.003	.003	.005
1/2	.003	.003	.003	.005
9/16	.003	.003	.003	.005
5/8	.004	.004	.004	.007
11/16	.004	.004	.004	.007
3/4	.004	.004	.004	.007
7/8	.005	–	–	.010
1	.005	–	–	.010
1 1/4	.006	–	–	.010

"D" inch	± Tolerance on "B" Class M Tolerance Shapes S, T, C, R, & W inch	Class M Tolerance Shape D inch	Class M Tolerance Shape V inch	Class U Tolerance Shapes S, T, & C inch
5/32	.003	–	–	–
3/16	.003	–	–	.005
7/32	.003	.004	–	.005
1/4	.003	.004	–	.005
5/16	.003	.004	–	.005
3/8	.003	.004	.007	.005
7/16	.005	.006	–	–
1/2	.005	.006	.010	.008
9/16	.005	.006	–	–
5/8	.006	.007	–	.011
11/16	.006	.007	–	.011
3/4	.006	.007	–	.011
7/8	.006	–	–	.015
1	.007	–	–	.015
1 1/4	.008	–	–	.015

ISO Carbide Inserts

KENLOC™ • NEGATIVE INSERTS • CNGG-FS

● first choice
○ alternate choice

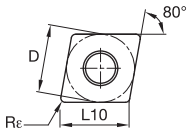


P	
M	
K	
N	
S	●
H	

ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KCS10B
CNGG120401FS	CNGG430FS	12,70	1/2	12,90	.508	0,1	.004	●
CNGG120402FS	CNGG4305FS	12,70	1/2	12,90	.508	0,2	.008	●
CNGG120404FS	CNGG431FS	12,70	1/2	12,90	.508	0,4	1/64	●
CNGG120408FS	CNGG432FS	12,70	1/2	12,90	.508	0,8	1/32	●

KENLOC • NEGATIVE INSERTS • CNMG-FP

● first choice
○ alternate choice

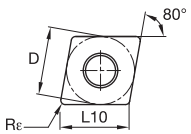


P	
M	
K	
N	
S	●
H	

ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KCS10B
CNMG120404FP	CNMG431FP	12,70	1/2	12,90	.508	0,4	1/64	●
CNMG120408FP	CNMG432FP	12,70	1/2	12,90	.508	0,8	1/32	●
CNMG120412FP	CNMG433FP	12,70	1/2	12,90	.508	1,2	3/64	●

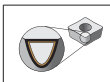
KENLOC • NEGATIVE INSERTS • CNMG-MP

● first choice
○ alternate choice



P	
M	
K	
N	
S	●
H	

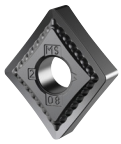
ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KCS10B
CNMG120404MP	CNMG431MP	12,70	1/2	12,90	.508	0,4	1/64	●
CNMG120408MP	CNMG432MP	12,70	1/2	12,90	.508	0,8	1/32	●
CNMG120412MP	CNMG433MP	12,70	1/2	12,90	.508	1,2	3/64	●
CNMG120416MP	CNMG434MP	12,70	1/2	12,90	.508	1,6	1/16	●
CNMG160612MP	CNMG543MP	15,88	5/8	16,12	.635	1,2	3/64	●
CNMG160616MP	CNMG544MP	15,88	5/8	16,12	.635	1,6	1/16	●

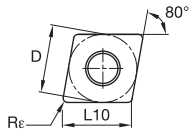
			NOVO
44	45	14-15	48

ISO Carbide Inserts

KENLOC™ • NEGATIVE INSERTS • CNMG-MS

● first choice
○ alternate choice



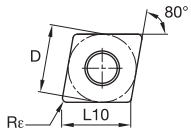


P	
M	
K	
N	
S	●
H	

ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KCS10B
CNMG120404MS	CNMG431MS	12,70	1/2	12,90	.508	0,4	1/64	●
CNMG120408MS	CNMG432MS	12,70	1/2	12,90	.508	0,8	1/32	●
CNMG120412MS	CNMG433MS	12,70	1/2	12,90	.508	1,2	3/64	●

KENLOC • NEGATIVE INSERTS • CNMG-RP

● first choice
○ alternate choice

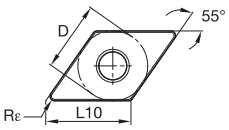


P	
M	
K	
N	
S	●
H	

ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KCS10B
CNMG120408RP	CNMG432RP	12,70	1/2	12,90	.508	0,8	1/32	●
CNMG120412RP	CNMG433RP	12,70	1/2	12,90	.508	1,2	3/64	●
CNMG120416RP	CNMG434RP	12,70	1/2	12,90	.508	1,6	1/16	●
CNMG160608RP	CNMG542RP	15,88	5/8	16,12	.635	0,8	1/32	●
CNMG160612RP	CNMG543RP	15,88	5/8	16,12	.635	1,2	3/64	●
CNMG160616RP	CNMG544RP	15,88	5/8	16,12	.635	1,6	1/16	●
CNMG190612RP	CNMG643RP	19,05	3/4	19,34	.762	1,2	3/64	●
CNMG190616RP	CNMG644RP	19,05	3/4	19,34	.762	1,6	1/16	●

KENLOC • NEGATIVE INSERTS • DNGG-FS

● first choice
○ alternate choice



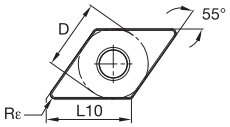
P	
M	
K	
N	
S	●
H	

ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KCS10B
DNGG150401FS	DNGG430FS	12,70	1/2	15,50	.610	0,1	.004	●
DNGG150601FS	DNGG440FS	12,70	1/2	15,50	.610	0,1	.004	●
DNGG150602FS	DNGG4405FS	12,70	1/2	15,50	.610	0,2	.008	●
DNGG150402FS	DNGG4305FS	12,70	1/2	15,50	.610	0,2	.008	●
DNGG150404FS	DNGG431FS	12,70	1/2	15,50	.610	0,4	1/64	●
DNGG150604FS	DNGG441FS	12,70	1/2	15,50	.610	0,4	1/64	●
DNGG150408FS	DNGG432FS	12,70	1/2	15,50	.610	0,8	1/32	●
DNGG150608FS	DNGG442FS	12,70	1/2	15,50	.610	0,8	1/32	●

ISO Carbide Inserts

KENLOC™ • NEGATIVE INSERTS • DNMG-FP

● first choice
○ alternate choice

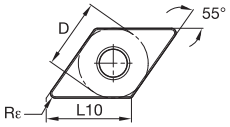


P	
M	
K	
N	
S	●
H	

ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KCS10B
DNMG110404FP	DNMG331FP	9,53	3/8	11,63	.458	0,4	1/64	●
DNMG110408FP	DNMG332FP	9,53	3/8	11,63	.458	0,8	1/32	●
DNMG150404FP	DNMG431FP	12,70	1/2	15,50	.610	0,4	1/64	●
DNMG150604FP	DNMG441FP	12,70	1/2	15,50	.610	0,4	1/64	●
DNMG150408FP	DNMG432FP	12,70	1/2	15,50	.610	0,8	1/32	●
DNMG150608FP	DNMG442FP	12,70	1/2	15,50	.610	0,8	1/32	●
DNMG150412FP	DNMG433FP	12,70	1/2	15,50	.610	1,2	3/64	●
DNMG150612FP	DNMG443FP	12,70	1/2	15,50	.610	1,2	3/64	●

KENLOC • NEGATIVE INSERTS • DNMG-MP

● first choice
○ alternate choice



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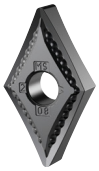
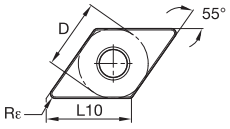
ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KCS10B
DNMG150404MP	DNMG431MP	12,70	1/2	15,50	.610	0,4	1/64	●
DNMG150604MP	DNMG441MP	12,70	1/2	15,50	.610	0,4	1/64	●
DNMG150408MP	DNMG432MP	12,70	1/2	15,50	.610	0,8	1/32	●
DNMG150608MP	DNMG442MP	12,70	1/2	15,50	.610	0,8	1/32	●
DNMG150412MP	DNMG433MP	12,70	1/2	15,50	.610	1,2	3/64	●
DNMG150612MP	DNMG443MP	12,70	1/2	15,50	.610	1,2	3/64	●

KENLOC • NEGATIVE INSERTS • DNMG-MS

● first choice
○ alternate choice





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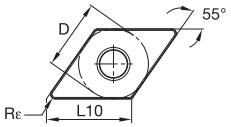
ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KCS10B
DNMG150404MS	DNMG431MS	12,70	1/2	15,50	.610	0,4	1/64	●
DNMG150604MS	DNMG441MS	12,70	1/2	15,50	.610	0,4	1/64	●
DNMG150408MS	DNMG432MS	12,70	1/2	15,50	.610	0,8	1/32	●
DNMG150608MS	DNMG442MS	12,70	1/2	15,50	.610	0,8	1/32	●
DNMG150412MS	DNMG433MS	12,70	1/2	15,50	.610	1,2	3/64	●
DNMG150612MS	DNMG443MS	12,70	1/2	15,50	.610	1,2	3/64	●

ISO Carbide Inserts

KENLOC™ • NEGATIVE INSERTS • DNMG-RP

● first choice
○ alternate choice



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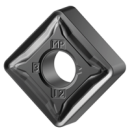
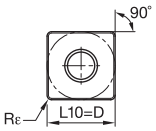
ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KCS10B
DNMG150408RP	DNMG432RP	12,70	1/2	15,50	.610	0,8	1/32	●
DNMG150608RP	DNMG442RP	12,70	1/2	15,50	.610	0,8	1/32	●
DNMG150412RP	DNMG433RP	12,70	1/2	15,50	.610	1,2	3/64	●
DNMG150612RP	DNMG443RP	12,70	1/2	15,50	.610	1,2	3/64	●

KENLOC • NEGATIVE INSERTS • SNMG-MP

● first choice
○ alternate choice





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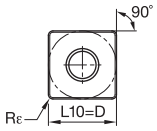
ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KCS10B
SNMG120408MP	SNMG432MP	12,70	1/2	12,70	.500	0,8	1/32	●
SNMG120412MP	SNMG433MP	12,70	1/2	12,70	.500	1,2	3/64	●
SNMG150608MP	SNMG542MP	15,88	5/8	15,88	.625	0,8	1/32	●
SNMG150612MP	SNMG543MP	15,88	5/8	15,88	.625	1,2	3/64	●

KENLOC • NEGATIVE INSERTS • SNMG-RP

● first choice
○ alternate choice



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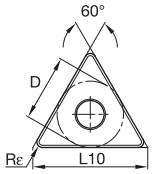
ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KCS10B
SNMG120408RP	SNMG432RP	12,70	1/2	12,70	.500	0,8	1/32	●
SNMG120412RP	SNMG433RP	12,70	1/2	12,70	.500	1,2	3/64	●
SNMG190612RP	SNMG643RP	19,05	3/4	19,05	.750	1,2	3/64	●
SNMG190616RP	SNMG644RP	19,05	3/4	19,05	.750	1,6	1/16	●

44	45	14-15	48

ISO Carbide Inserts

KENLOC™ • NEGATIVE INSERTS • TNMG-RP

● first choice
○ alternate choice



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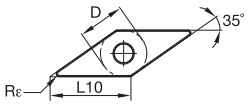
ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KCS10B
TNMG270616RP	TNMG544RP	15,88	5/8	27,50	1.083	1,6	1/16	●
TNMG330924RP	TNMG666RP	19,05	3/4	33,00	1.299	2,4	3/32	●

KENLOC • NEGATIVE INSERTS • VNGG-FS

● first choice
○ alternate choice



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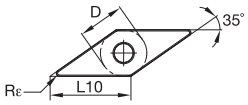
ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KCS10B
VNGG160401FS	VNGG330FS	9,53	3/8	16,61	.654	0,1	.004	●
VNGG160402FS	VNGG3305FS	9,53	3/8	16,61	.654	0,2	.008	●
VNGG160404FS	VNGG331FS	9,53	3/8	16,61	.654	0,4	1/64	●
VNGG160408FS	VNGG332FS	9,53	3/8	16,61	.654	0,8	1/32	●

KENLOC • NEGATIVE INSERTS • VNMG-FP

● first choice
○ alternate choice



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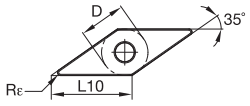
ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KCS10B
VNMG160404FP	VNMG331FP	9,53	3/8	16,61	.654	0,4	1/64	●
VNMG160408FP	VNMG332FP	9,53	3/8	16,61	.654	0,8	1/32	●

44	45	14-15	48

ISO Carbide Inserts

KENLOC™ • NEGATIVE INSERTS • VNMG-MP

● first choice
○ alternate choice



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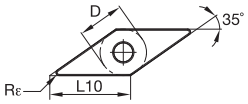
ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KCS10B
VNMG160404MP	VNMG331MP	9,53	3/8	16,61	.654	0,4	1/64	●
VNMG160408MP	VNMG332MP	9,53	3/8	16,61	.654	0,8	1/32	●
VNMG160412MP	VNMG333MP	9,53	3/8	16,61	.654	1,2	3/64	●

KENLOC • NEGATIVE INSERTS • VNMG-MS

● first choice
○ alternate choice



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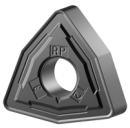
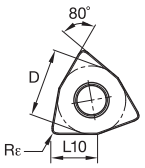
ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KCS10B
VNMG160402MS	VNMG3305MS	9,53	3/8	16,61	.654	0,2	.008	●
VNMG160404MS	VNMG331MS	9,53	3/8	16,61	.654	0,4	1/64	●
VNMG160408MS	VNMG332MS	9,53	3/8	16,61	.654	0,8	1/32	●
VNMG220404MS	VNMG431MS	12,70	1/2	22,14	.872	0,4	1/64	●
VNMG220408MS	VNMG432MS	12,70	1/2	22,14	.872	0,8	1/32	●

KENLOC • NEGATIVE INSERTS • WNMG-RP

● first choice
○ alternate choice





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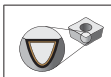
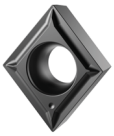
ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KCS10B
WNMG080408RP	WNMG432RP	12,70	1/2	8,69	.342	0,8	1/32	●
WNMG080412RP	WNMG433RP	12,70	1/2	8,69	.342	1,2	3/64	●

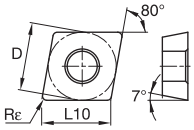
			NOVO
44	45	14-15	48

ISO Carbide Inserts

SCREW-ON • POSITIVE INSERTS • CCGT-LF

● first choice
○ alternate choice





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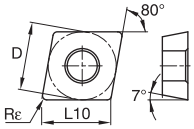
ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KCS10B
CCGT060202LF	CCGT21505LF	6,35	1/4	6,45	.254	0,2	.008	●
CCGT060204LF	CCGT2151LF	6,35	1/4	6,45	.254	0,4	1/64	●
CCGT060208LF	CCGT2152LF	6,35	1/4	6,45	.254	0,8	1/32	●
CCGT09T302LF	CCGT32505LF	9,53	3/8	9,67	.381	0,2	.008	●
CCGT09T304LF	CCGT3251LF	9,53	3/8	9,67	.381	0,4	1/64	●
CCGT09T308LF	CCGT3252LF	9,53	3/8	9,67	.381	0,8	1/32	●

SCREW-ON • POSITIVE INSERTS • CCMT-MP

● first choice
○ alternate choice



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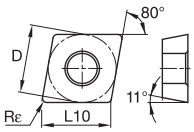
ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KCS10B
CCMT060204MP	CCMT2151MP	6,35	1/4	6,45	.254	0,4	1/64	●
CCMT060208MP	CCMT2152MP	6,35	1/4	6,45	.254	0,8	1/32	●
CCMT09T304MP	CCMT3251MP	9,53	3/8	9,67	.381	0,4	1/64	●
CCMT09T308MP	CCMT3252MP	9,53	3/8	9,67	.381	0,8	1/32	●
CCMT120404MP	CCMT431MP	12,70	1/2	12,90	.508	0,4	1/64	●
CCMT120408MP	CCMT432MP	12,70	1/2	12,90	.508	0,8	1/32	●

SCREW-ON • POSITIVE INSERTS • CPGT-LF

● first choice
○ alternate choice



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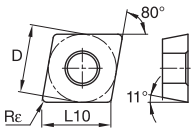
ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KCS10B
CPGT060202LF	CPGT21505LF	6,35	1/4	6,45	.254	0,2	.008	●
CPGT060204LF	CPGT2151LF	6,35	1/4	6,45	.254	0,4	1/64	●
CPGT060208LF	CPGT2152LF	6,35	1/4	6,45	.254	0,8	1/32	●
CPGT09T302LF	CPGT32505LF	9,53	3/8	9,67	.381	0,2	.008	●
CPGT09T304LF	CPGT3251LF	9,53	3/8	9,67	.381	0,4	1/64	●
CPGT09T308LF	CPGT3252LF	9,53	3/8	9,67	.381	0,8	1/32	●

ISO Carbide Inserts

SCREW-ON • POSITIVE INSERTS • CPMT-MP

● first choice
○ alternate choice



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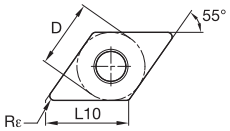
ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KCS10B
CPMT060204MP	CPMT2151MP	6,35	1/4	6,45	.254	0,4	1/64	●
CPMT060208MP	CPMT2152MP	6,35	1/4	6,45	.254	0,8	1/32	●
CPMT09T304MP	CPMT3251MP	9,53	3/8	9,67	.381	0,4	1/64	●
CPMT09T308MP	CPMT3252MP	9,53	3/8	9,67	.381	0,8	1/32	●

SCREW-ON • POSITIVE INSERTS • DCGT-LF

● first choice
○ alternate choice



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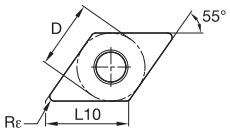
ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KCS10B
DCGT070202LF	DCGT21505LF	6,35	1/4	7,75	.305	0,2	.008	●
DCGT070204LF	DCGT2151LF	6,35	1/4	7,75	.305	0,4	1/64	●
DCGT070208LF	DCGT2152LF	6,35	1/4	7,75	.305	0,8	1/32	●
DCGT11T302LF	DCGT32505LF	9,53	3/8	11,63	.458	0,2	.008	●
DCGT11T304LF	DCGT3251LF	9,53	3/8	11,63	.458	0,4	1/64	●
DCGT11T308LF	DCGT3252LF	9,53	3/8	11,63	.458	0,8	1/32	●

SCREW-ON • POSITIVE INSERTS • DCMT-MP

● first choice
○ alternate choice



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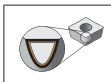
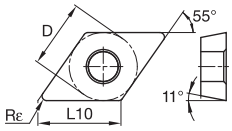
ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KCS10B
DCMT11T304MP	DCMT3251MP	9,53	3/8	11,63	.458	0,4	1/64	●
DCMT11T308MP	DCMT3252MP	9,53	3/8	11,63	.458	0,8	1/32	●
DCMT11T312MP	DCMT3253MP	9,53	3/8	11,63	.458	1,2	3/64	●

			NOVO
44	45	14-15	48

ISO Carbide Inserts

SCREW-ON • POSITIVE INSERTS • DPGT-LF

● first choice
○ alternate choice



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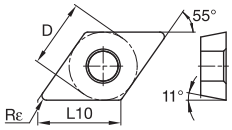
ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KCS10B
DPGT070202LF	DPGT21505LF	6,35	1/4	7,75	.305	0,2	.008	●
DPGT070204LF	DPGT2151LF	6,35	1/4	7,75	.305	0,4	1/64	●
DPGT070208LF	DPGT2152LF	6,35	1/4	7,75	.305	0,8	1/32	●
DPGT11T302LF	DPGT32505LF	9,53	3/8	11,63	.458	0,2	.008	●
DPGT11T304LF	DPGT3251LF	9,53	3/8	11,63	.458	0,4	1/64	●
DPGT11T308LF	DPGT3252LF	9,53	3/8	11,63	.458	0,8	1/32	●

SCREW-ON • POSITIVE INSERTS • DPMT-MP

● first choice
○ alternate choice



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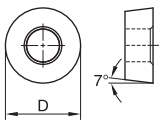
ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KCS10B
DPMT11T304MP	DPMT3251MP	9,53	3/8	11,63	.458	0,4	1/64	●
DPMT11T308MP	DPMT3252MP	9,53	3/8	11,63	.458	0,8	1/32	●
DPMT11T312MP	DPMT3253MP	9,53	3/8	11,63	.458	1,2	3/64	●

SCREW-ON • POSITIVE INSERTS • RCGT-MS

● first choice
○ alternate choice



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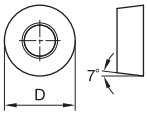
ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KCS10B
RCGT0803M0MS	RCGT0803M0MS	8,00	.315	–	–	–	–	●
RCGT1204M0MS	RCGT1204M0MS	12,00	.472	–	–	–	–	●

44	45	14-15	48

ISO Carbide Inserts

SCREW-ON • POSITIVE INSERTS • RCMT-MP

● first choice
○ alternate choice



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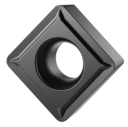
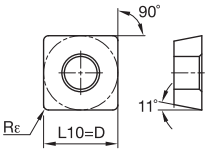
ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KCS10B
RCMT0803M0MP	RCMT0803M0MP	8,00	.315	–	–	–	–	●
RCMT10T3M0MP	RCMT10T3M0MP	10,00	.394	–	–	–	–	●
RCMT1204M0MP	RCMT1204M0MP	12,00	.472	–	–	–	–	●
RCMT120400MP	RCMT43MP	12,70	1/2	–	–	–	–	●
RCMT1606M0MP	RCMT1606M0MP	16,00	.630	–	–	–	–	●

SCREW-ON • POSITIVE INSERTS • SCGT-LF

● first choice
○ alternate choice





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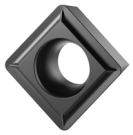
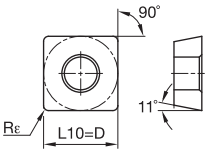
ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KCS10B
SCGT09T304LF	SCGT3251LF	9,53	3/8	9,53	.375	0,4	1/64	●
SCGT09T308LF	SCGT3252LF	9,53	3/8	9,53	.375	0,8	1/32	●
SCGT120404LF	SCGT431LF	12,70	1/2	12,70	.500	0,4	1/64	●
SCGT120408LF	SCGT432LF	12,70	1/2	12,70	.500	0,8	1/32	●
SCGT120412LF	SCGT433LF	12,70	1/2	12,70	.500	1,2	3/64	●

SCREW-ON • POSITIVE INSERTS • SPGT-LF

● first choice
○ alternate choice





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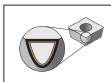
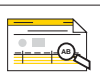
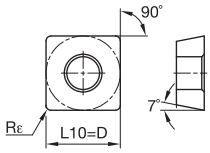
ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KCS10B
SPGT09T304LF	SPGT3251LF	9,53	3/8	9,53	.375	0,4	1/64	●
SPGT09T308LF	SPGT3252LF	9,53	3/8	9,53	.375	0,8	1/32	●

			NOVO
44	45	14-15	48

ISO Carbide Inserts

SCREW-ON • POSITIVE INSERTS • SCMT-MP

● first choice
○ alternate choice



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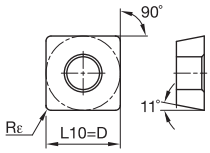
ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KCS10B
SCMT09T304MP	SCMT3251MP	9,53	3/8	9,53	.375	0,4	1/64	●
SCMT09T308MP	SCMT3252MP	9,53	3/8	9,53	.375	0,8	1/32	●
SCMT120404MP	SCMT431MP	12,70	1/2	12,70	.500	0,4	1/64	●
SCMT120408MP	SCMT432MP	12,70	1/2	12,70	.500	0,8	1/32	●

SCREW-ON • POSITIVE INSERTS • SPMT-MP

● first choice
○ alternate choice



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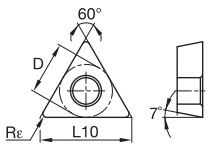
ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KCS10B
SPMT09T304MP	SPMT3251MP	9,53	3/8	9,53	.375	0,4	1/64	●
SPMT09T308MP	SPMT3252MP	9,53	3/8	9,53	.375	0,8	1/32	●
SPMT120404MP	SPMT431MP	12,70	1/2	12,70	.500	0,4	1/64	●
SPMT120408MP	SPMT432MP	12,70	1/2	12,70	.500	0,8	1/32	●

SCREW-ON • POSITIVE INSERTS • TCGT-LF

● first choice
○ alternate choice



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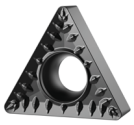
ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KCS10B
TCGT110204LF	TCGT2151LF	6,35	1/4	11,00	.433	0,4	1/64	●
TCGT110208LF	TCGT2152LF	6,35	1/4	11,00	.433	0,8	1/32	●
TCGT16T302LF	TCGT32505LF	9,53	3/8	16,50	.650	0,2	.008	●
TCGT16T304LF	TCGT3251LF	9,53	3/8	16,50	.650	0,4	1/64	●
TCGT16T308LF	TCGT3252LF	9,53	3/8	16,50	.650	0,8	1/32	●

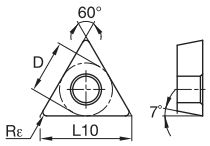
44	45	14-15	48

ISO Carbide Inserts

SCREW-ON • POSITIVE INSERTS • TCMT-MP

● first choice
○ alternate choice





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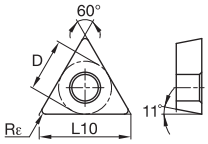
ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KCS10B
TCMT110204MP	TCMT2151MP	6,35	1/4	11,00	.433	0,4	1/64	●
TCMT110208MP	TCMT2152MP	6,35	1/4	11,00	.433	0,8	1/32	●
TCMT16T304MP	TCMT3251MP	9,53	3/8	16,50	.650	0,4	1/64	●
TCMT16T308MP	TCMT3252MP	9,53	3/8	16,50	.650	0,8	1/32	●

SCREW-ON • POSITIVE INSERTS • TPGT-LF

● first choice
○ alternate choice



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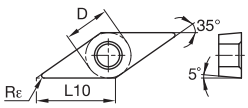
ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KCS10B
TPGT090202LF	TPGT181505LF	5,56	7/32	9,62	.379	0,2	.008	●
TPGT090204LF	TPGT18151LF	5,56	7/32	9,62	.379	0,4	1/64	●
TPGT110202LF	TPGT21505LF	6,35	1/4	11,00	.433	0,2	.008	●
TPGT110204LF	TPGT2151LF	6,35	1/4	11,00	.433	0,4	1/64	●
TPGT110208LF	TPGT2152LF	6,35	1/4	11,00	.433	0,8	1/32	●

SCREW-ON • POSITIVE INSERTS • VBGT-LF

● first choice
○ alternate choice



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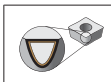
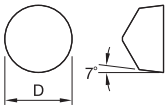
ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KCS10B
VBGT110302LF	VBGT2205LF	6,35	1/4	11,07	.436	0,2	.008	●
VBGT110304LF	VBGT221LF	6,35	1/4	11,07	.436	0,4	1/64	●
VBGT110308LF	VBGT222LF	6,35	1/4	11,07	.436	0,8	1/32	●
VBGT160402LF	VBGT3305LF	9,53	3/8	16,61	.654	0,2	.008	●
VBGT160404LF	VBGT331LF	9,53	3/8	16,61	.654	0,4	1/64	●
VBGT160408LF	VBGT332LF	9,53	3/8	16,61	.654	0,8	1/32	●

			NOVO
44	45	14-15	48

ISO Carbide Inserts

KENDEX™ • POSITIVE INSERTS • RCGX-MP/RCGV-MP

● first choice
○ alternate choice



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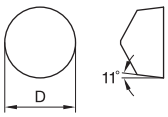
ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KCS10B
RCGX060400MP	RCGV23MP	6,35	1/4	–	–	–	–	●
RCGX090700MP	RCGV35MP	9,53	3/8	–	–	–	–	●
RCGX120700MP	RCGV45MP	12,70	1/2	–	–	–	–	●

KENDEX • POSITIVE INSERTS • RPGX-MP/RPGV-MP

● first choice
○ alternate choice



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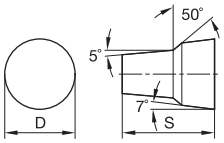
ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KCS10B
RPGX060400MP	RPGV23MP	6,35	1/4	–	–	–	–	●
RPGX090700MP	RPGV35MP	9,53	3/8	–	–	–	–	●
RPGX120700MP	RPGV45MP	12,70	1/2	–	–	–	–	●

44	45	14-15	48

ISO Carbide Inserts

K-LOCK™ • POSITIVE INSERTS • RCGK-FS

● first choice
○ alternate choice



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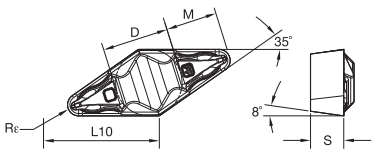
ISO catalog number	ANSI catalog number	D mm	D in	S mm	S in	KCS10B
RCGK040300FS	RCGK152FS	4,75	.187	6,59	.260	●
RCGK060400FS	RCGK23FS	6,35	1/4	9,30	.366	●
RCGK090700FS	RCGK35FS	9,53	3/8	13,23	.521	●
RCGK120800FS	RCGK46FS	12,70	1/2	16,92	.666	●

TOP NOTCH™ PROFILING • POSITIVE INSERTS • VCGR-FP

● first choice
○ alternate choice



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ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	S mm	S in	M mm	M in	Rε mm	Rε in	KCS10B
VCGR160402FP	VCGR3305FP	9,52	3/8	16,61	.654	4,76	3/16	10,60	.417	0,2	.008	●
VCGR160404FP	VCGR331FP	9,52	3/8	16,61	.654	4,76	3/16	10,15	.400	0,4	1/64	●
VCGR160408FP	VCGR332FP	9,52	3/8	16,61	.654	4,76	3/16	9,23	.363	0,8	1/32	●
VCGR160412FP	VCGR333FP	9,52	3/8	16,61	.654	4,76	3/16	8,31	.327	1,2	3/64	●

			NOVO
44	45	14-15	48

ISO Carbide Inserts

KCS10B™ • WEAR IDENTIFICATION

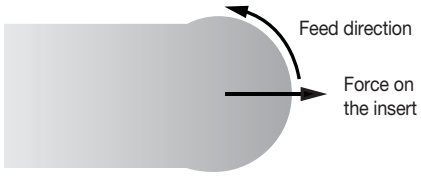
WEAR PROGRESSION

The new KCS10B coating provides easy wear identification. The shown wear pattern indicates end of tool life is near.

An extremely smooth coating surface, reducing friction, providing longer tool life, increasing process reliability.

The new KCS10B turning grade, featuring the new High-Power Impulse Magnetron Sputtering (High-PIMS) is ideal for iron-based alloys (S1), cobalt-based alloys (S2), and nickel-based alloys (S3).

KCS10B • PROFILING WITH TOP NOTCH



Multiple feed direction profiling with highest accuracy and excellent surface finishes.

Rigid clamping mechanism holds insert precisely in place and eliminates insert movement.

Desired shape = Programmed shape.

Strong insert design.

Accurate indexing.

Superior clamping forces.

Second cutting edge protected from chip hammering.

ISO Carbide Inserts

HIGH-TEMPERATURE ALLOYS • TROUBLESHOOTING

Material Characteristics

- High forces at the cutting edge.
- High heat concentration in cutting area.
- High cutting speed may cause insert failure by plastic deformation.
- Relatively poor tool life.
- Small depths of cut are difficult.
- Rapid work-hardening.
- Usually abrasive rather than hard.

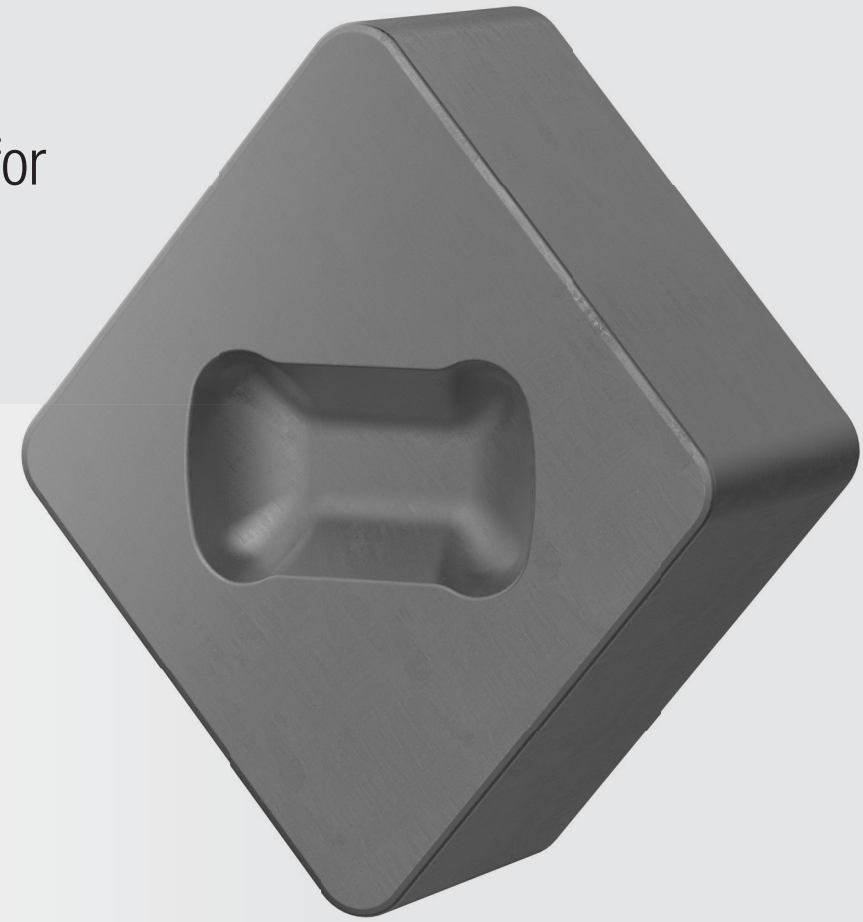
Troubleshooting

Problem	Solution	
Depth-of-cut notch	1. Increase toolholder lead angle. 2. Use tougher grades like KC5025™ and KY4300™ in -MS, -MP, and -RP geometries, or ceramic grade KYS30™/KYS25™. 3. Use a 0,63mm/.025" or greater depth of cut. 4. Depth of cut should be greater than the work-hardened layer resulting from the previous cut (>0,12mm/.005"). 5. Program a ramp to vary depth of cut. 6. Feed greater than 0,12mm/.005 IPR. 7. Use strongest insert shape possible. 8. When possible, use round inserts in carbide grade KCS10B™, or ceramic grade KYS30/KYS25. 9. Decrease depth to 1/7 of insert diameter for round inserts (i.e.: 1,90mm/.075" max. depth for 12,7mm/1/2" IC RNG45).	 Depth-of-cut notch
Built-up edge	1. Increase speed. 2. Use grades KYS30 or KY4300. 3. Use positive rake, sharp PVD coated grade KCS10B. 4. Use flood coolant.	 Built-up edge
Chipping	1. Use MG-MS geometry in place of MG-FS geometries. 2. For interrupted cutting, maintain speed and decrease feed. 3. Use a tougher grade like KC5025.	 Chipping

POWERED BY NOVO

KYK10

Ceramic Turning Grade for Cast Iron



Materials

K

Applications

- O.D. Turning
- Facing
- Multi-Direction
- Chamfer Turning
- Boring
- I.D. Facing

kennametal.com/KYK10

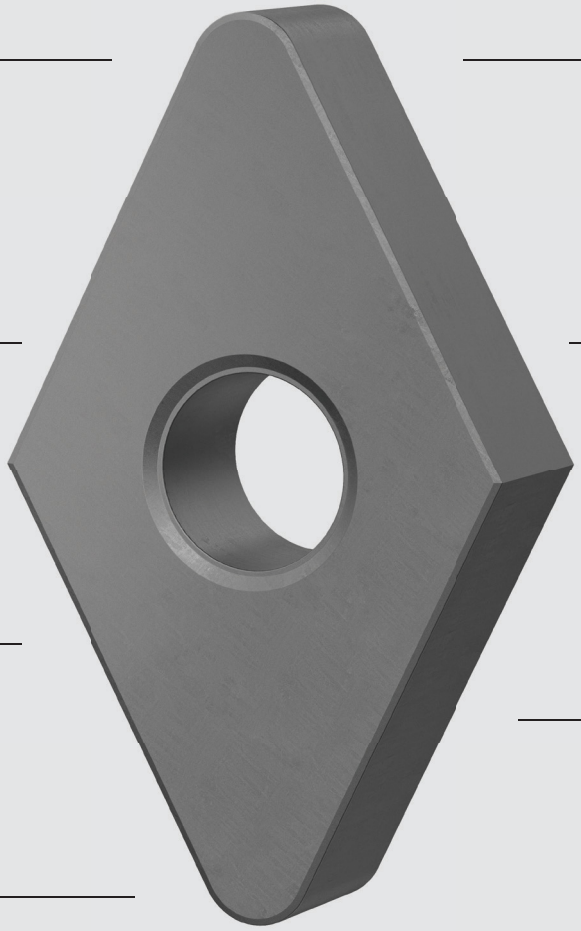
KYK10 ceramic turning grade is a high-performance solution for cast iron materials. Ideal for continuous and lightly interrupted cuts.

Machining gray cast iron components such as brake disks or fly wheels, KYK10 offers great wear resistance, toughness, and improved fracture toughness.

The new SiAlON ceramic turning grade features a 30% increased speed capability.

Highest productivity through maximum cutting speeds.

Dimple clamping provides exceptional rigidity.



Excellent for roughing to finishing operations.

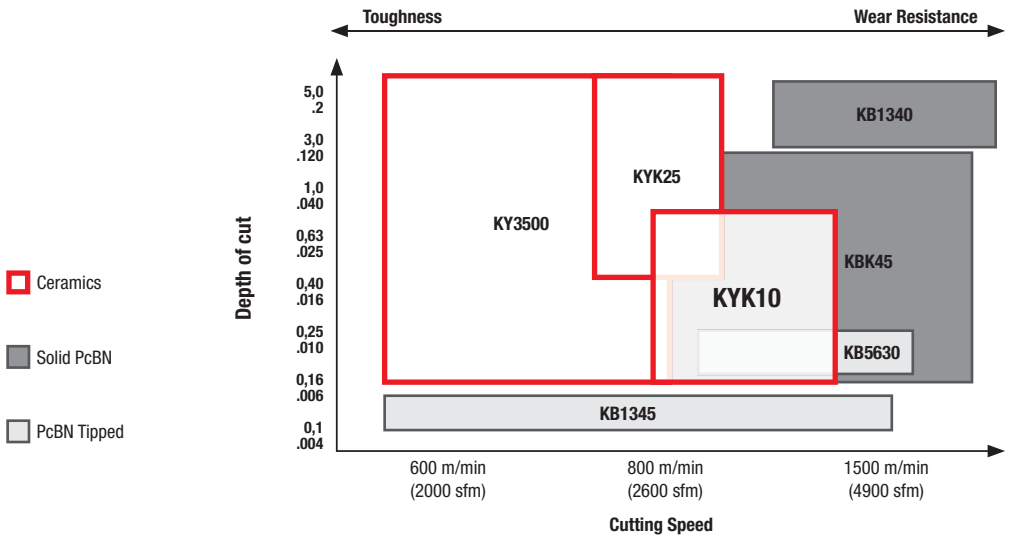
Precision ground inserts in G tolerance for finishing applications.

Pressed-to-size inserts in M tolerance for roughing and medium machining.

The KYK10 turning grade shows high chemical resistance. Also withstands high temperatures and higher speeds to provide longer tool life.

Suitable for wet or dry machining.

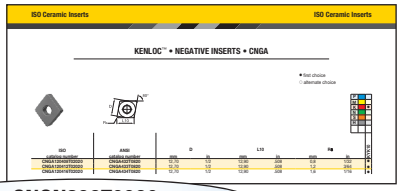
Cast Iron Grades Overview



Advanced Material Inserts

ISO INSERT • CATALOG NUMBERING SYSTEM

Each character in our catalog number signifies a specific trait of that product.
Use the following key columns and corresponding images to easily identify which attributes apply.



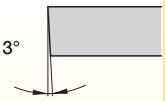
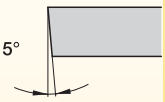
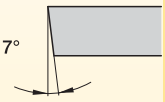
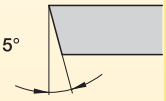
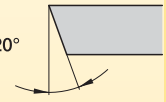
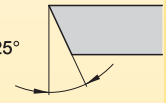
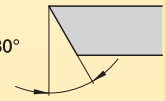
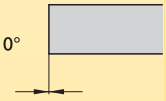
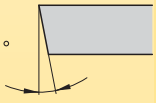
CNGN32T0820

C	N	G	N	3
Insert Shape	Insert Clearance Angle	Tolerance Class	Insert Features	Size

Insert Shape

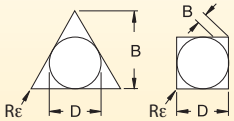
H	Hexagon 120°	
O	Octagon 135°	
P	Pentagon 108°	
R	Round —	
S	Square 90°	
T	Triangular 60°	
C D E M V	Rhomboid 80° 55° 75° 86° 35°	
W	Trigon 80° with enlarged corner angles	
L	Rectangular 90°	
A B N/K	Parallelogram 85° 82° 55°	

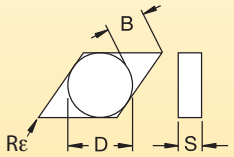
Insert Clearance Angle

A	3°	
B	5°	
C	7°	
D	15°	
E	20°	
F	25°	
G	30°	
N	0°	
P	11°	
O	For other clearance angles requiring descriptions.	

Tolerance Class

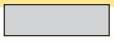
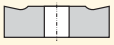
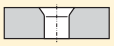
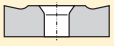
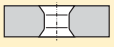
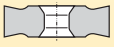
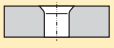
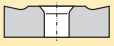
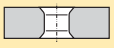
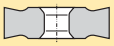
Tolerances apply prior to edge prep and coating.





D = Theoretical diameter of the insert inscribed circle
S = Thickness
B = See figures below

Insert Features

N	
R	
F	
A	
M	
G	
W	
T	
Q	
U	
B	
H	
C	
J	
X V	Special Design

Size

"D"		Code for inch cutting edge length "L10"						
inch	inch	C	D	R	S	T	V	W
1.2 (5)	5/32	S4	04	03	03	06	—	—
1.5 (6)	3/16	04	05	04	04	08	08	S3
1.8 (7)	7/32	05	06	05	05	09	09	03
—	.236	—	—	06	—	—	—	—
2	1/4	06	07	06	06	11	11	04
2.5	5/16	08	09	07	07	13	13	05
—	.315	—	—	08	—	—	—	—
3	3/8	09	11	09	09	16	16	06
—	.394	—	—	10	—	—	—	—
3.5	7/16	11	13	11	11	19	19	07
—	.472	—	—	12	—	—	—	—
4	1/2	12	15	12	12	22	22	08
4.5	9/16	14	17	14	14	24	24	09
5	5/8	16	19	15	15	27	27	10
—	.630	—	—	16	—	—	—	—
5.5	11/16	17	21	17	17	30	30	11
6	3/4	19	23	19	19	33	33	13
—	.787	—	—	20	—	—	—	—
7	7/8	22	27	22	22	38	38	15
—	.984	—	—	25	—	—	—	—
8	1	25	31	25	25	44	44	17
10	1-1/4	32	38	31	31	54	54	21
—	1.260	—	—	32	—	—	—	—

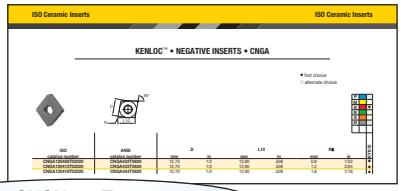
tolerance class*	tolerance on "D"	tolerance on "B"	tolerance on "S"
C	±.0010"	±.0005"	±.001"
H	±.0005"	±.0005"	±.001"
E	±.0010"	±.0010"	±.001"
G	±.0010"	±.0010"	±.005"
M	See tables on next page		±.005"
U	See tables on next page		±.005"

*Tolerances apply prior to edge prep and coating.

Advanced Material Inserts

ISO INSERT • CATALOG NUMBERING SYSTEM

(continued)



CNGN3**32T0820**

3	2		T	08	20		
Thickness "S"	Corner Radius "Rε"	Hand of Insert *(optional)*	Cutting Edge *(optional)*	T-Land Width *(optional)*	T-Land Angle *(optional)*	Tip Style *(optional)*	Chipbreaker *(optional)*

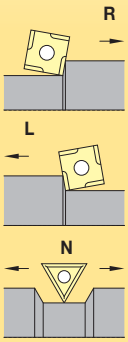
symbol inch	thick-ness inch
.5 (1)	1/32
.6	.040
1 (2)	1/16
1.2	5.64
1.5 (3)	3/32
2	1/8
2.5	5/32
3	3/16
3.5	7/32
4	1/4
5	5/16
6	3/8
7	7/16
8	1/2

symbol inch	corner radius inch
X0	.0015
0	.004
.5	.008
1	1/64
2	1/32
3	3/64
4	1/16
5	5/64
6	3/32
7	7/64
8	1/8
–	round insert
–	

R = Right hand

L = Left hand

N = Neutral



F* Sharp

E Rounded

T* Chamfered

S* Chamfered and Rounded

K Double-Chamfered

P Double-Chamfered and Rounded

*Also available in wiper style.

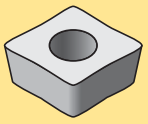
symbol ANSI	inch size
04	.004
08	.008

symbol	size
10	10°
15	15°
20	20°
25	25°
30	30°

FW = Finishing Wiper

MW = Medium Wiper

symbol	usage
C	full top
M	mini tip
MT	multi-tip
ST	single tip



"D" inch	± Tolerance on "D" Class M Tolerance Shapes S, T, C, R, & W inch	Shape D inch	Shape V inch	Class U Tolerance Shapes S, T, & C inch
5/32	.002	–	–	–
3/16	.002	–	–	.003
7/32	.002	.002	.002	.003
1/4	.002	.002	.002	.003
5/16	.002	.002	.002	.003
3/8	.002	.002	.002	.003
7/16	.003	.003	.003	.005
1/2	.003	.003	.003	.005
9/16	.003	.003	.003	.005
5/8	.004	.004	.004	.007
11/16	.004	.004	.004	.007
3/4	.004	.004	.004	.007
7/8	.005	–	–	.010
1	.005	–	–	.010
1 1/4	.006	–	–	.010

"D" inch	± Tolerance on "B" Class M Tolerance Shapes S, T, C, R, & W inch	Shape D inch	Shape V inch	Class U Tolerance Shapes S, T, & C inch
5/32	.003	–	–	–
3/16	.003	–	–	.005
7/32	.003	.004	–	.005
1/4	.003	.004	–	.005
5/16	.003	.004	–	.005
3/8	.003	.004	.007	.005
7/16	.005	.006	–	–
1/2	.005	.006	.010	.008
9/16	.005	.006	–	–
5/8	.006	.007	–	.011
11/16	.006	.007	–	.011
3/4	.006	.007	–	.011
7/8	.006	–	–	.015
1	.007	–	–	.015
1 1/4	.008	–	–	.015

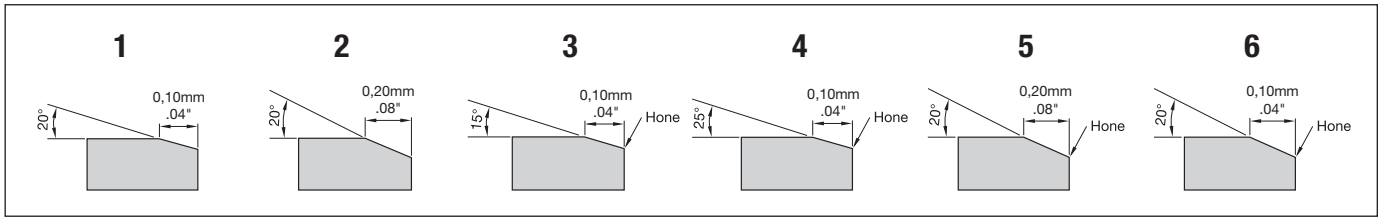
ISO Turning Inserts

CAST IRON • TOOL SELECTION GUIDE

Toughness ← → Wear Resistance

	Ceramic Inserts												
	KY3500					KYK25				KYK10			
Geometry	GX		GN	GA		GX	GN	GA		GX	GN	GA	
Profile **See bottom of page*	2	1	2	2	1	2	2	2	1	2	2	2	1
Clamping Rigidity	■■■	■■■	■■	■	■	■■■	■■	■	■	■■■	■■	■	■
Edge Preperation Metric	T02020	T01020FW	T02020	T02020	T01020FW	T02020	T02020	T02020	T01020FW	T02020	T02020	T02020	T01020FW
Edge Preperation Inch	T0820	T0420FW	T0820	T0820	T0420FW	T0820	T0820	T0820	T0420FW	T0820	T0820	T0820	T0420FW
T-Land	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Honed													
Wiper		✔			✔				✔				✔
Application													
Heavy-Roughing	●		●			●	●			○	○		
Roughing	●	○	●	●		●	●	●		●	●	●	
Medium Machining	●	●	●	●	●	●	●	●	●	●	●	●	●
Finishing		○	○	○	●	○	○	○	●	○	○	○	●
Fine-Finishing													
Cutting Condition													
Heavily Interrupted Cut	●		●			●	●			○	○		
Lightly Interrupted Cut	●	○	●	●	○	●	●	●	○	●	●	●	○
Varying Depth of Cut, Casting or Forging Skin	●	●	●	●	●	●	●	●	●	●	●	●	●
Smooth Cut, Pre-Turned Surface	○	●	○	○	●	○	○	○	●	●	●	●	●

● first choice
○ alternate choice



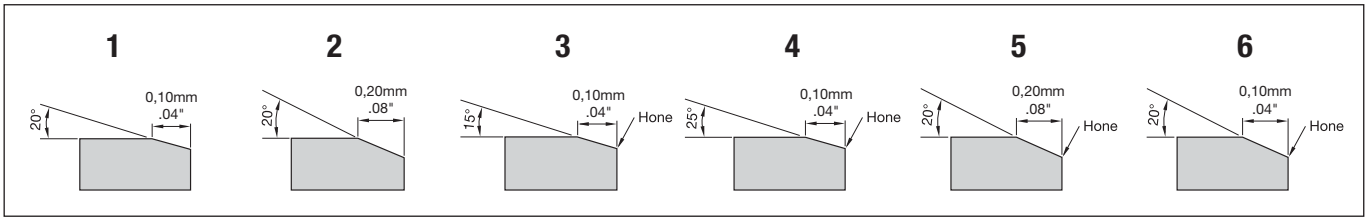
ISO Turning Inserts

CAST IRON • TOOL SELECTION GUIDE

Toughness ← → Wear Resistance

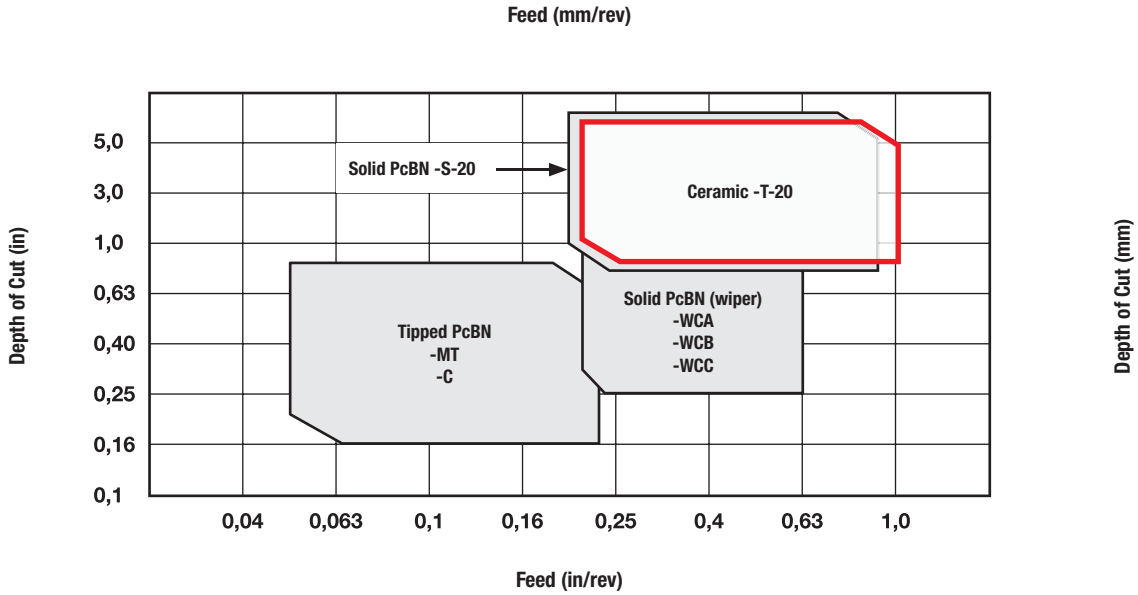
	Solid PcBN Inserts						Tipped PcBN Inserts		
	KBK45			KB1340			KB5630		KB1345
Geometry	GX	GN		GX			GA		GA
Profile **See bottom of page*	5	5	3	5	3	3	4	3	6
Clamping Rigidity	■■■	■■	■■	■■■	■■■	■■■	■	■	■
Edge Preperation Metric	S02020	S02020	S01015W..	S02020	S01015	S01015FW	S01025	S01025FW	S01020
Edge Preperation Inch	S0820	S0820	S0415W..	S0820	S0415	S0415FW	S0425	S0425FW	S0420
T-Land	✔	✔	✔	✔	✔	✔	✔	✔	✔
Honed	✔	✔	✔	✔	✔	✔	✔	✔	✔
Wiper			✔			✔		✔	
Application									
Heavy-Roughing	●	●		●					
Roughing	●	●	○	●	○		○		
Medium Machining	●	●	●	●	●	●	●	○	○
Finishing	○	○	●	○	○	●	●	●	●
Fine-Finishing			○			○	○	●	●
Cutting Condition									
Heavily Interrupted Cut	●	●	○	●	●	○	○		
Lightly Interrupted Cut	●	●	●	●	●	●	●	●	●
Varying Depth of Cut, Casting or Forging Skin	●	●	●	●	●	●	●	●	●
Smooth Cut, Pre-Turned Surface	●	●	●	●	●	●	●	●	●

● first choice
○ alternate choice



ISO Turning Inserts

CAST IRON • APPLICATION DATA • FEED



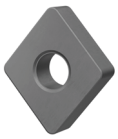
CAST IRON • APPLICATION DATA • SPEED

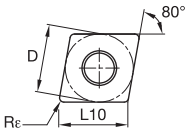
material group	grade	Speed — m/min (SFM) 60 (200)	180 (600)	305 (1000)	430 (1400)	550 (1800)	675 (2200)	800 (2600)	920 (3000)	1040 (3400)	1160 (3800)	1290 (4200)	1400 (4600)	1530 (5000)	Starting Conditions m/min	SFM
K1	KY3500														700	2300
	KYK25														700	2300
	KYK10														800	2600
	KBK45														1000	3250
	KB1340														1000	3250
	KB5630														800	2600
	KB1345														800	2600

ISO Ceramic Inserts

KENLOC™ • NEGATIVE INSERTS • CNGA

● first choice
○ alternate choice



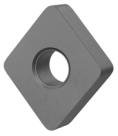


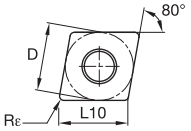
P	
M	
K	●
N	
S	
H	

ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KYK10
CNGA120408T02020	CNGA432T0820	12,70	1/2	12,90	.508	0,8	1/32	●
CNGA120412T02020	CNGA433T0820	12,70	1/2	12,90	.508	1,2	3/64	●
CNGA120416T02020	CNGA434T0820	12,70	1/2	12,90	.508	1,6	1/16	●

KENLOC • NEGATIVE INSERTS • CNGA-FW

● first choice
○ alternate choice



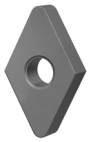


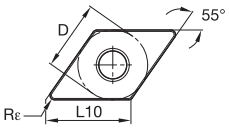
P	
M	
K	●
N	
S	
H	

ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KYK10
CNGA120412T01020FW	CNGA433T0420FW	12,70	1/2	12,90	.508	1,2	3/64	●

KENLOC • NEGATIVE INSERTS • DNGA

● first choice
○ alternate choice





P	
M	
K	●
N	
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H	

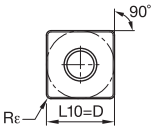
ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KYK10
DNGA150416T02020	DNGA434T0820	12,70	1/2	15,50	.610	1,6	1/16	●

44	45	34-35	48

ISO Ceramic Inserts

KENLOC™ • NEGATIVE INSERTS • SNGA

● first choice
○ alternate choice

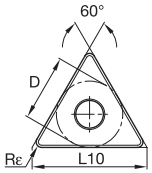


P	M	K	N	S	H
		●			

ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KYK10
SNGA120408T02020	SNGA432T0820	12,70	1/2	12,70	.500	0,8	1/32	●

KENLOC • NEGATIVE INSERTS • TNGA

● first choice
○ alternate choice



P	M	K	N	S	H
		●			

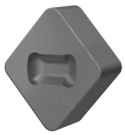
ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KYK10
TNGA160408T02020	TNGA332T0820	9,53	3/8	16,50	.650	0,8	1/32	●

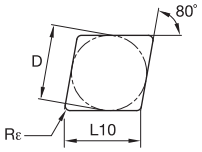
44	45	34-35	48

ISO Ceramic Inserts

KENDEX™ • NEGATIVE INSERTS • CNGX

● first choice
○ alternate choice





P		
M		
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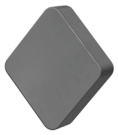
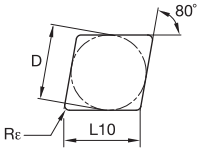
S		
H		

ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KYK10
CNGX120712T02020	CNGX453T0820	12,70	1/2	12,90	.508	1,2	3/64	●
CNGX120716T02020	CNGX454T0820	12,70	1/2	12,90	.508	1,6	1/16	●

KENDEX • NEGATIVE INSERTS • CNMN

● first choice
○ alternate choice





P		
M		
K		●
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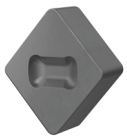
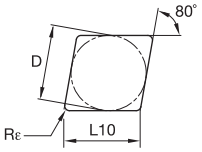
H		

ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KYK10
CNMN120412T02020	CNM433T0820	12,70	1/2	12,90	.508	1,2	3/64	●
CNMN120416T02020	CNM434T0820	12,70	1/2	12,90	.508	1,6	1/16	●

KENDEX • NEGATIVE INSERTS • CNMX

● first choice
○ alternate choice





P		
M		
K		●
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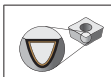
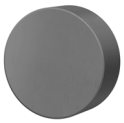
ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KYK10
CNMX120712T02020	CNMX453T0820	12,70	1/2	12,90	.508	1,2	3/64	●
CNMX120716T02020	CNMX454T0820	12,70	1/2	12,90	.508	1,6	1/16	●

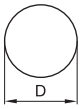
			NOVO
44	45	34-35	48

ISO Ceramic Inserts

KENDEX • NEGATIVE INSERTS • RNGN

● first choice
○ alternate choice



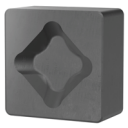


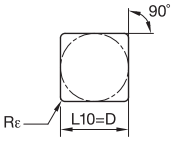
P	
M	
K	●
N	
S	
H	

ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KYK10
RNGN120400T02020	RNG43T0820	12,70	1/2	–	–	–	–	●

KENDEX • NEGATIVE INSERTS • SNGX

● first choice
○ alternate choice



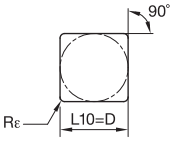


P	
M	
K	●
N	
S	
H	

ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KYK10
SNGX120712T02020	SNGX453T0820	12,70	1/2	12,70	.500	1,2	3/64	●
SNGX120716T02020	SNGX454T0820	12,70	1/2	12,70	.500	1,6	1/16	●
SNGX150724T02020	SNGX556T0820	15,88	5/8	15,88	.625	2,4	3/32	●

KENDEX • NEGATIVE INSERTS • SNMN

● first choice
○ alternate choice



P	
M	
K	●
N	
S	
H	

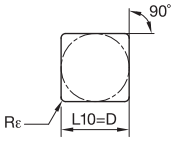
ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KYK10
SNMN120412T02020	SNM433T0820	12,70	1/2	12,70	.500	1,2	3/64	●
SNMN120416T02020	SNM434T0820	12,70	1/2	12,70	.500	1,6	1/16	●

44	45	34-35	48

ISO Ceramic Inserts

KENDEX™ • NEGATIVE INSERTS • SNMX

● first choice
○ alternate choice

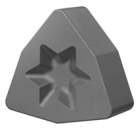


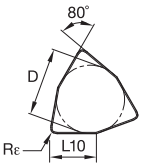
P		
M		
K		●
N		
S		
H		

ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KYK10
SNMX120712T02020	SNMX453T0820	12,70	1/2	12,70	.500	1,2	3/64	●
SNMX120716T02020	SNMX454T0820	12,70	1/2	12,70	.500	1,6	1/16	●

KENDEX • NEGATIVE INSERTS • WNGX

● first choice
○ alternate choice





P		
M		
K		●
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S		
H		

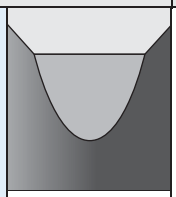
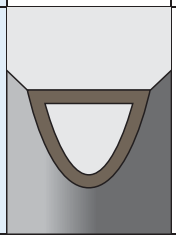
ISO catalog number	ANSI catalog number	D mm	D in	L10 mm	L10 in	Rε mm	Rε in	KYK10
WNGX080712T02020	WNGX453T0820	12,70	1/2	8,69	.342	1,2	3/64	●

44	45	34-35	48

Grade and Grade Descriptions

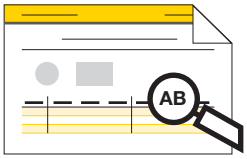
TURNING

wear resistance ⟷ toughness

Coating		Grade Description		05	10	15	20	25	30	35	40	45
KYK10	 –	Composition: An advanced SiAlON ceramic grade. Application: Provides maximum wear resistance. Used for high-speed continuous turning of gray cast iron, including through scale. To be used for varying cast iron machinability.	K									
KCS10B		Composition: PVD-AlTiN coating with a very smooth coating surface and extremely hard, wear-resistant ultra fine-grain carbide substrate. Application: The KCS10B™ grade is ideal for medium machining and finishing operations of Nickel-Based, Cobalt-Based, and Iron-Based High-Temperature Alloys. The extremely hard, wear-resistant carbide substrate allows for longer tool life while the ultra fine-grain carbide substrate and smoother coating reduces friction.	S									

General Information

KEY TO PRODUCT TABLE COLUMN HEADINGS



You may notice a slight change in the appearance of our product tables and specification charts. In this catalog, Kennametal introduces a set of short-name codes to improve the readability of tables and drawings. These codes replace full-text descriptions. The full list of codes and their definitions can be found below.

Short-Name Code	Full Text Description
D	Insert: Insert IC Size
L10	Insert Cutting Edge Length
M	Insert Gage Dimension
Rε	Corner Radius
S	Insert Thickness

Material Cross Reference • ANSI

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
S	High-Temp Alloys
H	Hardened Materials
C	CFRP Materials

material group	description	content	tensile strength RM (MPa)*	hardness (HB)	hardness (HRC)	material number
P0	Low-Carbon Steels, Long Chipping	C <0,25%	<530	<125	–	A36, 1008, 1010, 1018 through 1029; 1108, 1117
P1	Low-Carbon Steels, Short Chipping, Free Machining	C <0,25%	<530	<125	–	10L18, 1200 Series, 1213, 12L14
P2	Medium- and High-Carbon Steels	C >0,25%	>530	<220	<25	1035, 1045, 10L45, 1050, 10L50, 1080, 1137, 1144, 11L44, 1525, 1545, 1572
P3	Alloy Steels and Tool Steels	C >0,25%	600–850	<330	<35	1300, 2000, 3000, 4000, 5000, 8000, P20, SAE: A, D, H, O, S, M, T
P4	Alloy Steels and Tool Steels	C >0,25%	850–1400	340–450	35–48	1300, 2000, 3000, 4000, 5000, 8000, P20, SAE: A, D, H, O, S, M, T
P5	Ferritic, Martensitic, and PH Stainless Steels	–	600–900	<330	<35	15–5 PH, 13–8 PH, 17–4 PH, 400 and 500 Series
P6	High-Strength Ferritic, Martensitic, and PH Stainless Steels	–	900–1350	350–450	35–48	15–5 PH, 13–8 PH, 17–4 PH, 400 and 500 Series
M1	Austenitic Stainless Steel	–	<600	130–200	–	200 Series, 301, 302, 304, 304L, 309
M2	High-Strength Austenitic Stainless and Cast Stainless Steels	–	600–800	150–230	<25	310, 316, 316L, 321, 347, 384 ASTM Cast XM-1, XM-5, XM-7, XM-21
M3	Duplex Stainless Steel	–	<800	135–275	<30	323, 329, F55, 2205, S329000
K1	Gray Cast Iron	–	125–500	120–290	<32	class 20, 25, 30, 35, 40, 45, 50, 55, 60, G1800, G3000, G3500, G4000
K2	Low- and Medium-Strength Ductile Irons (Nodular Irons) and Compacted Graphite Irons (CGI)	–	<600	130–260	<28	60-40-18, 65-45-12, 80-55-06; SAE J434: D4018, D4512, D5506; ASTM A47: Grade 32510, 35018; SAE J158: Grade M3210, M4504, M5003, M5503, M7002; ASTMA842: Grade 250, 300, 350, 400, 450
K3	High-Strength Ductile Irons and Austempered Ductile Iron (ADI)	–	>600	180–350	<43	ASTM A536:100-70-03, 120-90-02, SAE J434: D7003, SAE J158: Grade M8501AST A897: 125-80-10, 150-100-7, 175-125-4, 200-150-1, 230-185
N1	Wrought Aluminum	–	–	–	–	2025, 5050, 7050, 1000, 2017
N2	Low-Silicon Aluminum Alloys and Magnesium Alloys	Si <12,2%	–	–	–	2024, 6061, 7075
N3	High-Silicon Aluminum Alloys and Magnesium Alloys	Si >12,2%	–	–	–	–
N4	Copper-, Brass-, Zinc-Based on Machinability Index Range of 70–100	–	–	–	–	C81500
N5	Nylon, Plastics, Rubbers, Phenolics, Resins, Fiberglass	–	–	–	–	–
N6	Carbon, Graphite Composites, CFRP	–	–	–	–	Graphite, CFK, CFRP
N7	Metal Matrix Composites (MMC)	–	–	–	–	C63000
S1	Iron-Based, Heat-Resistant Alloys	–	500–1200	160–260	25–48	A-286, INCOLOY® 800 Series, A608, A567, Discaloy, INVAR®, N-155, 16-25-6, 19-9 DL; Cast: ASTM A-297, A-351, A-567, A-608
S2	Cobalt-Based, Heat-Resistant Alloys	–	1000–1450	250–450	25–48	Haynes® 25 (L605), Haynes 188, J-1570, Stellite™, AiResist 213; Cast: AiResist 13, Haynes 21, MAR-M302, MAR-M509, NASA Co-W-Re, WI-52
S3	Nickel-Based, Heat-Resistant Alloys	–	600–1700	160–450	<48	Astroloy™, Hastelloy® B/C/ C-276 /X, INCONEL® 600 and 700 Series, IN102, INCOLOY 900 Series, Rene 41, Waspalloy, MONEL®, K-500, MAR-M20, NIMONIC®, UDIMET®
S4	Titanium and Titanium Alloys	–	900–1600	300–400	33–48	Pure: Ti 98.8, Ti 98.9,Ti 99.9; Alloyed: Ti 5Al-2.5Sn, Ti6Al-4V, Ti6Al-2Sn-4Zr-2Mo, Ti-3Al-8V-6Cr-4Mo-4Zr, Ti-10V-2Fe-3Al, Ti-13V-11Cr-3Al
H1	Hardened Materials	–	–	–	44–48	Tool Steel H10, H11, H13, D2, D3, 4340, P20
H2	Hardened Materials	–	–	–	48–55	Tool Steel H10, H11, H13, D2, D3, 4340, P20
H3	Hardened Materials	–	–	–	56–60	Tool Steel H10, H11, H13, D2, D3, 4340, P20
H4	Hardened Materials	–	–	–	>60	Tool Steel H10, H11, H13, D2, D3, 4340, P20
C1	CFRP, CFRP/CFRP	–	–	–	–	–
C2	CFRP/Non-Ferrous	–	–	–	–	–
C3	CFRP/High-Temp	–	–	–	–	–
C4	CFRP/Stainless Steel	–	–	–	–	–
C5	CFRP/Non-Ferrous/High-Temp	–	–	–	–	–

Material Cross Reference • DIN

P Steel
M Stainless Steel
K Cast Iron

N Non-Ferrous
S High-Temp Alloys

H Hardened Materials
C CFRP Materials

material group	description	content	tensile strength RM (MPa)*	hardness (HB)	hardness (HRC)	material number
P0	Low-Carbon Steels, Long Chipping	C <0,25%	<530	<125	–	–
P1	Low-Carbon Steels, Short Chipping, Free Machining	C <0,25%	<530	<125	–	C15, Ck22, ST37-2, S235JR, 9SMnPb28, GS38
P2	Medium- and High-Carbon Steels	C >0,25%	>530	<220	<25	ST52, S355JR, C35, GS60, Cf53
P3	Alloy Steels and Tool Steels	C >0,25%	600–850	<330	<35	16MnCr5, Ck45, 21CrMoV5-7, 38SMn28
P4	Alloy Steels and Tool Steels	C >0,25%	850–1400	340–450	35–48	100Cr6, 30CrNiMo8, 42CrMo4, C70W2, S6525, X120Mn12
P5	Ferritic, Martensitic, and PH Stainless Steels	–	600–900	<330	<35	100Cr6, 30CrNiMo8, 42CrMo4, C70W2, S6525, X120Mn12
P6	High-Strength Ferritic, Martensitic, and PH Stainless Steels	–	900–1350	350–450	35–48	X102CrMo17, G-X120Cr29
M1	Austenitic Stainless Steel	–	<600	130–200	–	X5CrNi 18 10, X2CrNiMo 17 13 2, G-X25CrNiSi18 9, X15CrNiSi 20 12
M2	High-Strength Austenitic Stainless and Cast Stainless Steels	–	600–800	150–230	<25	X2CrNiMo 13 4, X5NiCr 32 21, X5CrNiNb 18 10, G-X15CrNi 25-20
M3	Duplex Stainless Steel	–	<800	135–275	<30	X8CrNiMo27 5, X2CrNiMoN22 5 3, X20CrNiSi25 4, G-X40CrNiSi27 4
K1	Gray Cast Iron	–	125–500	120–290	<32	GG15, GG25, GG30, GG40, GTW40
K2	Low- and Medium-Strength Ductile Irons (Nodular Irons) and Compacted Graphite Irons (CGI)	–	<600	130–260	<28	GGG40, GTS35
K3	High-Strength Ductile Irons and Austempered Ductile Iron (ADI)	–	>600	180–350	<43	GGG60, GTW55, GTS65
N1	Wrought Aluminum	–	–	–	–	AlMg1, Al99.5, AlCuMg1, AlCuBiPb, AlMgSi1, ALMgSiPb
N2	Low-Silicon Aluminum Alloys and Magnesium Alloys	Si <12,2%	–	–	–	GAlSiCu4, GDAlSi10Mg
N3	High-Silicon Aluminum Alloys and Magnesium Alloys	Si >12,2%	–	–	–	G-ALSi12, G-AlSi17Cu4, G-AlSi21CuNiMg
N4	Copper-, Brass-, Zinc-Based on Machinability Index Range of 70–100	–	–	–	–	CuZn40, Ms60, G-CuSn5ZnPb, CuZn37, CuSi3Mn
N5	Nylon, Plastics, Rubbers, Phenolics, Resins, Fiberglass	–	–	–	–	LEXAN®, Hostalen™, Polystyrol®, MAKROLON
N6	Carbon, Graphite Composites, CFRP	–	–	–	–	CFK, GFK
N7	Metal Matrix Composites (MMC)	–	–	–	–	–
S1	Iron-Based, Heat-Resistant Alloys	–	500–1200	160–260	25–48	X1NiCrMoCu32 28 7, X12NiCrSi36 16, X5NiCrAlTi31 20, X40CoCrNi20 20
S2	Cobalt-Based, Heat-Resistant Alloys	–	1000–1450	250–450	25–48	Haynes® 188, Stellite® 6,21,31
S3	Nickel-Based, Heat-Resistant Alloys	–	600–1700	160–450	<48	INCONEL® 690, INCONEL 625, Hastelloy®, NIMONIC® 75
S4	Titanium and Titanium Alloys	–	900–1600	300–400	33–48	Ti1, TiAl5Sn2, TiAl6V4, TiAl4Mo4Sn2
H1	Hardened Materials	–	–	–	44–48	GX260NiCr42, GX330NiCr42, GX300CrNiSi952, GX300CrMo153, Hardox® 400
H2	Hardened Materials	–	–	–	48–55	–
H3	Hardened Materials	–	–	–	56–60	–
H4	Hardened Materials	–	–	–	>60	–
C1	CFRP, CFRP/CFRP	–	–	–	–	–
C2	CFRP/Non-Ferrous	–	–	–	–	–
C3	CFRP/High Temp	–	–	–	–	–
C4	CFRP/Stainless Steel	–	–	–	–	–
C5	CFRP/Non-Ferrous/High-Temp	–	–	–	–	–

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METALCUTTING SAFETY

IMPORTANT SAFETY INSTRUCTIONS

Read before using the tools in this catalog!

Projectile and Fragmentation Hazards:

Modern metalcutting operations involve high spindle and cutter speeds and high temperatures and cutting forces. Hot metal chips may fly off the workpiece during metalcutting. Although cutting tools are designed and manufactured to withstand high cutting forces and temperatures, they can sometimes fragment, particularly if they are subjected to over-stress, severe impact, or other abuse.

To avoid injury:

- Always wear appropriate personal protective equipment, including safety goggles, when operating metalcutting machines or working nearby.
- Always make sure all machine guards are in place.

Breathing and Skin Contact Hazards:

Grinding carbide or other advanced cutting tool materials produces dust or mist containing metallic particles. Breathing this dust or mist — especially over an extended period — can cause temporary or permanent lung disease or make existing medical conditions worse. Contact with this dust or mist can irritate eyes, skin, and mucous membranes and may make existing skin conditions worse.

To avoid injury:

- Always wear breathing protection and safety goggles when grinding.
- Provide ventilation control and collect and properly dispose of dust, mist, or sludge from grinding.
- Avoid skin contact with dust or mist.

For more information, read the applicable Material Safety Data Sheet provided by Kennametal and consult General Industry Safety and Health Regulations, Part 1910, Title 29 of the Code of Federal Regulations.

These safety instructions are general guidelines. Many variables affect machining operations. It is impossible to cover every specific situation. The technical information included in this catalog and recommendations on machining practices may not apply to your particular operation. For more information, consult the Kennametal Metalcutting Safety booklet, available free from Kennametal at 724 539 5747 or fax 724 539 5439. For specific product safety and environmental questions, contact our Corporate Environmental Health and Safety Office at 724 539 5066 or fax 724 539 5372.

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