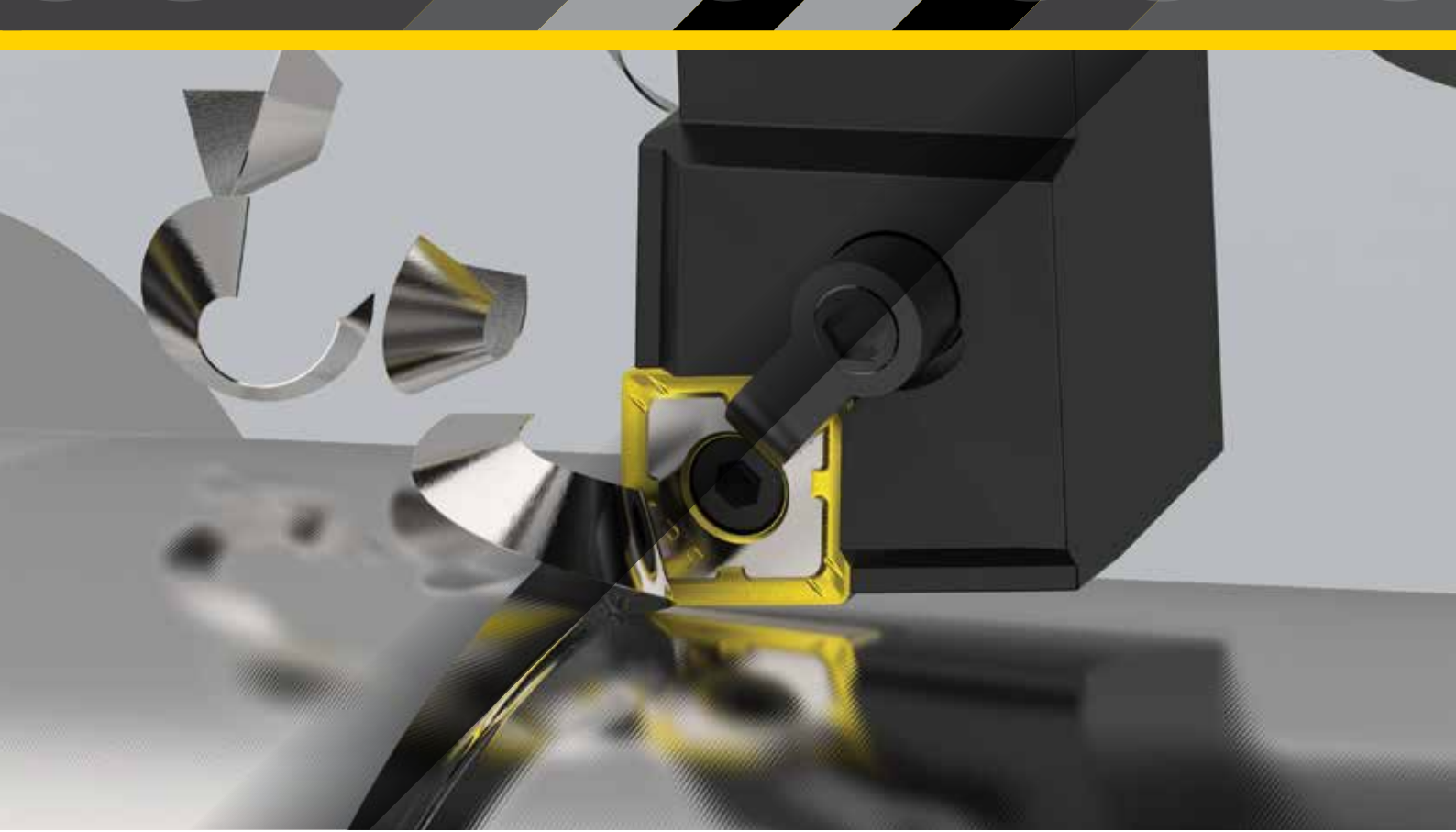




CUTTING TOOLS

Stellram® Cutting Tools



HIGH PERFORMANCE TURNING SOLUTIONS

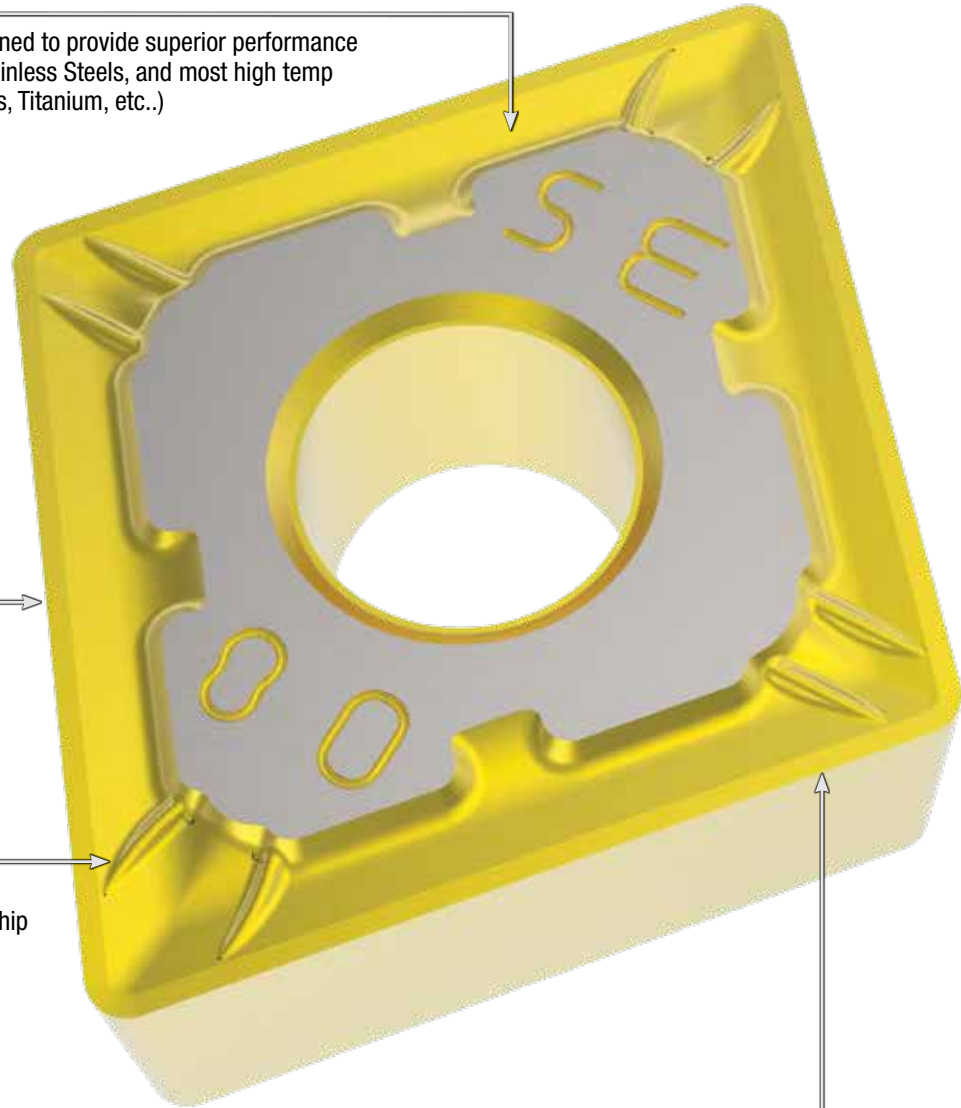




New Turning geometry for superior chip breaking in difficult to machine materials

Available in CVD and PVD grades

Grades specifically designed to provide superior performance and longer tool life in Stainless Steels, and most high temp alloys (Inconel, Hastelloys, Titanium, etc..)



Bottom Ground

Improved seating surface

Double Rake Angle Design

Lower cutting forces and lower pressure on the chip, improving chip control and machine stability

Unique Chip Breaker Design

Reinforced chipbreaker with precise honing:

- Longer tool life
- Reduced Depth of cut notching
- Prevents built up edge



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Machining Materials Guide	3
5E Geometry	4
First Choice Charts	5 - 7
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D Style	13 - 14
R Style	15
S Style.....	16 - 18
T Style.....	19 - 20
W Style.....	21



The following Material Guide pages enable you to select the appropriate geometry and grade along with a suggested start point for speeds and feeds. Simply select the material to be machined and type of machining operation.

1st Choice

- 1 Select your material.
- 2 Select your machining operation from finishing to heavy roughing.
- 3 Recommended geometry for the operation.
- 4 Maximum and minimum depth of cut for this geometry.
- 5 Maximum and minimum feed for this geometry.
- 6 Choose the machining condition as below:

Interrupted cut



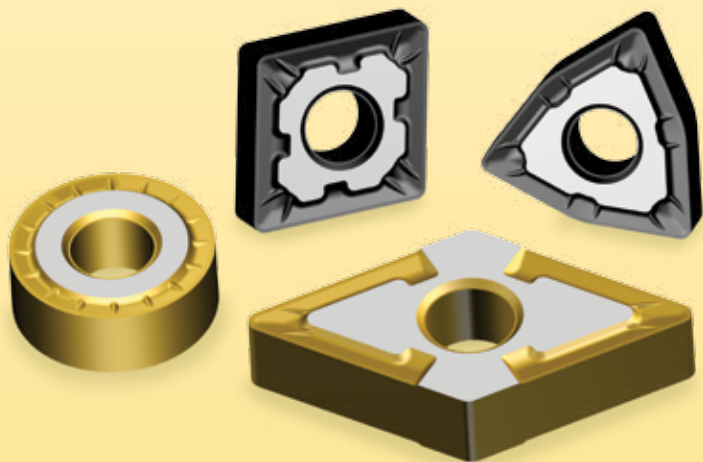
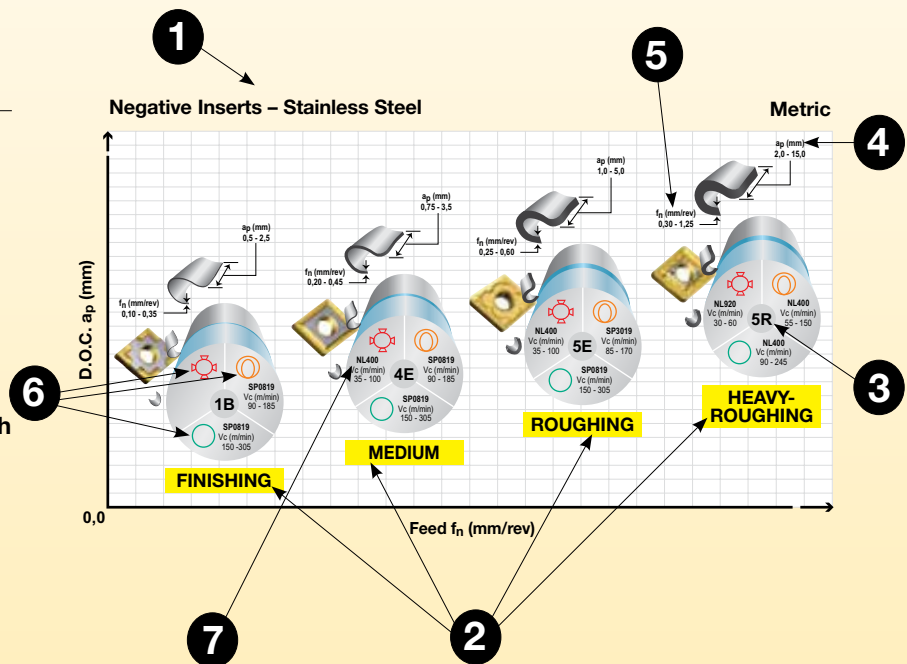
Varying depth of cut

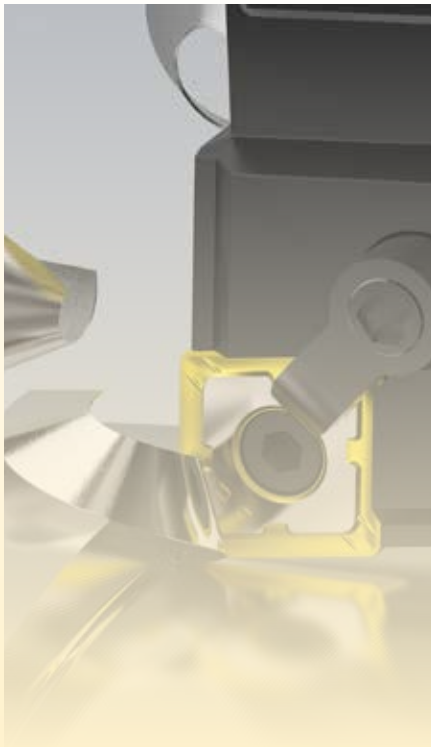


Good condition



- 7 Recommended grade and cutting speeds for this condition.





Unalloyed Steels



Alloyed Steels



Stainless Steels



PH Stainless



Cast Irons



Aluminum & Alloys



High Temperature Alloys



Hard Materials (52-56 HRC)



Material Guide – Key to Recommended Inserts

Material Designation

Unalloyed Steels
 Alloyed Steels
 Stainless Steels
 PH Stainless
 Cast Irons
 Aluminum & Alloys
 High Temp. Alloys
 Hard Materials

5E Geometry Technical Information

Roughing to Heavy Roughing:

The 5E has been specifically designed for demanding applications, it provides the high edge security of a negative insert with a precise positive cutting action. Ideal for the machining of Steel, Stainless Steels, High Nickel, High Cobalt, and Titanium based alloys
Available in Grades: SP0819, SP3019, NL400 & NL920

Materials Application

SP0819						
P	M	K	N	S	H	
	◆					◆

SP3019						
P	M	K	N	S	H	
	◆					◆

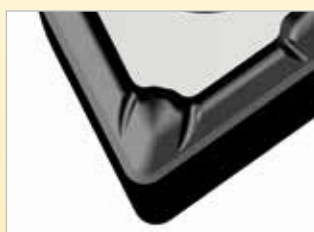
NL400						
P	M	K	N	S	H	
	◆					◆

NL920						
P	M	K	N	S	H	
	◆					◆

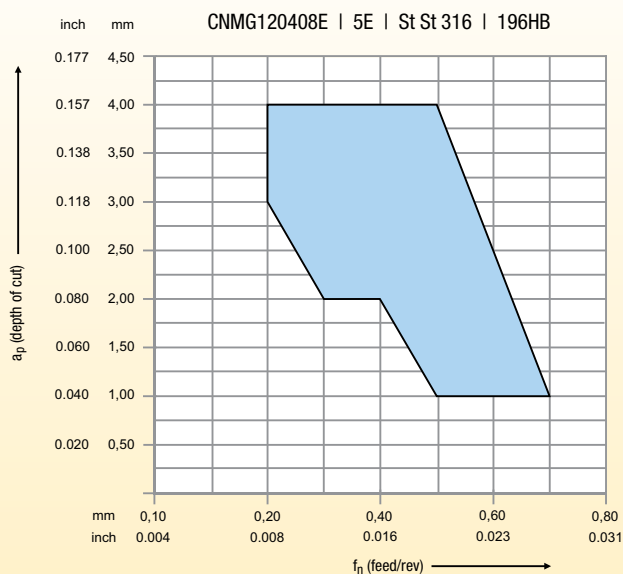
Cutting Condition



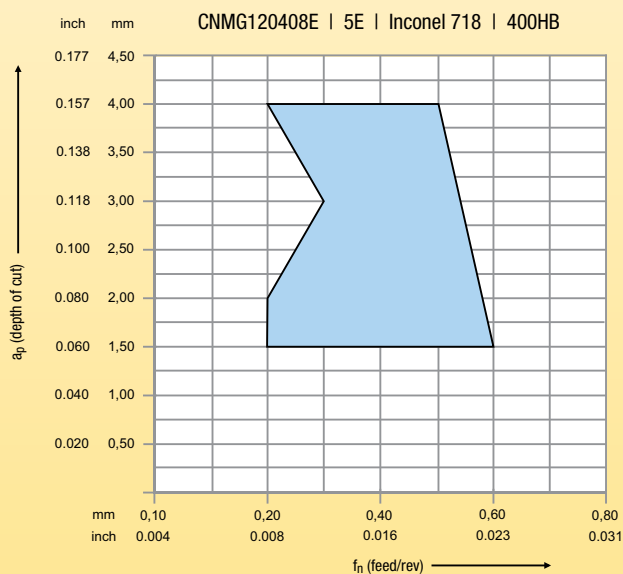
Profile



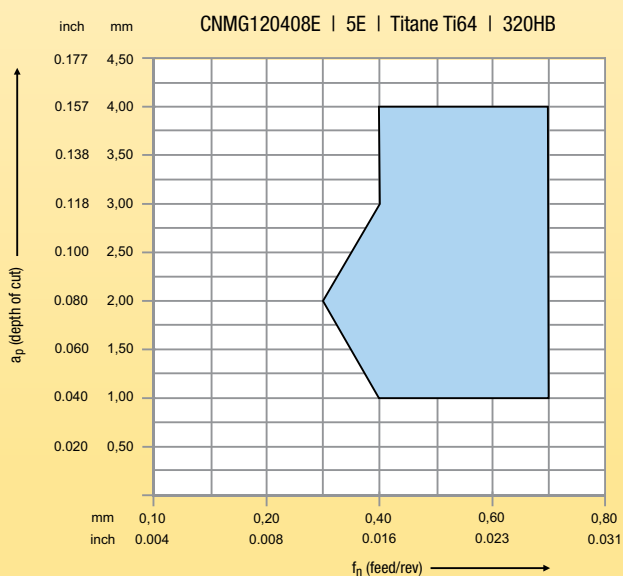
Chip Control



Chip Control



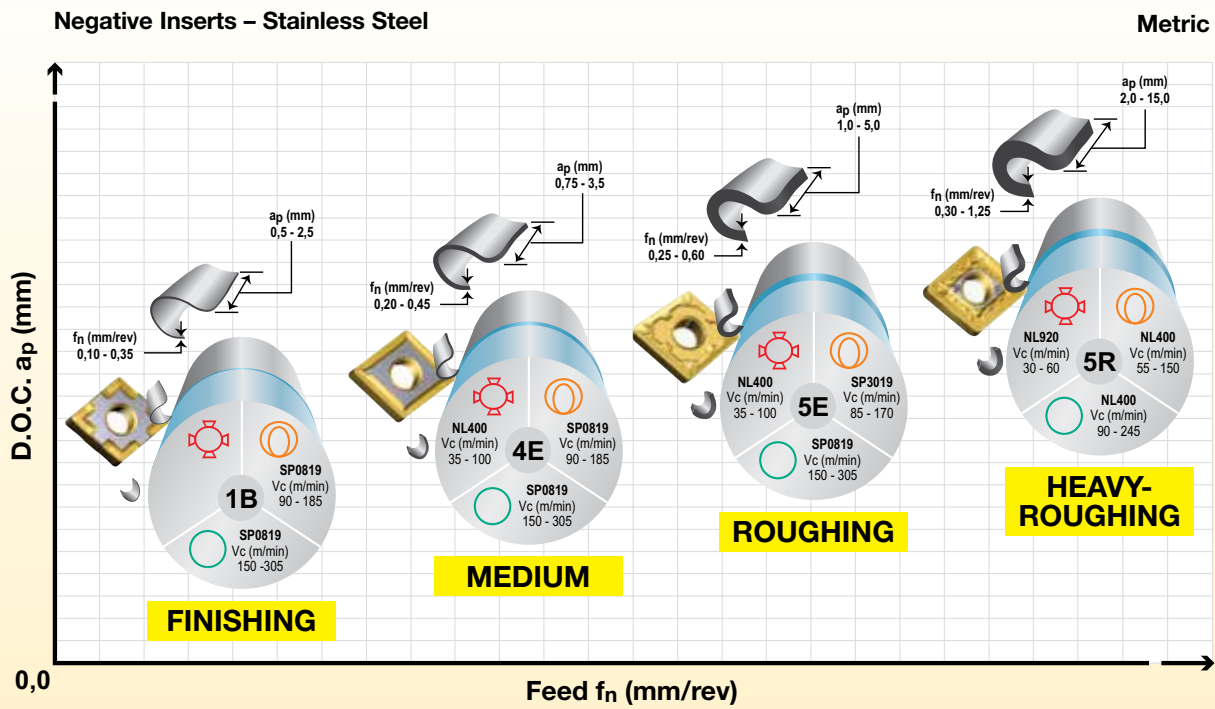
Chip Control



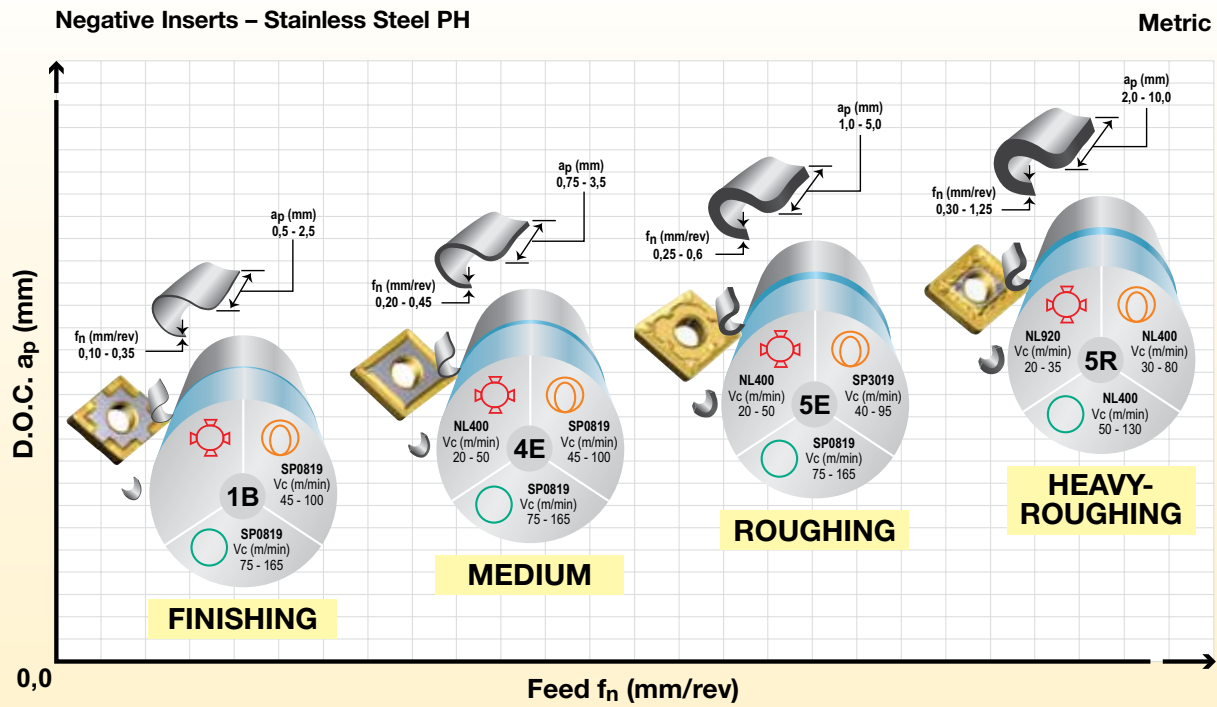
Material Guide – Key to Recommended Inserts

Material Designation

- ◆ Unalloyed Steels
- ◆ Alloyed Steels
- ◆ Stainless Steels
- ◆ PH Stainless
- ◆ Cast Irons
- ◆ Aluminum & Alloys
- ◆ High Temp. Alloys
- ◆ Hard Materials

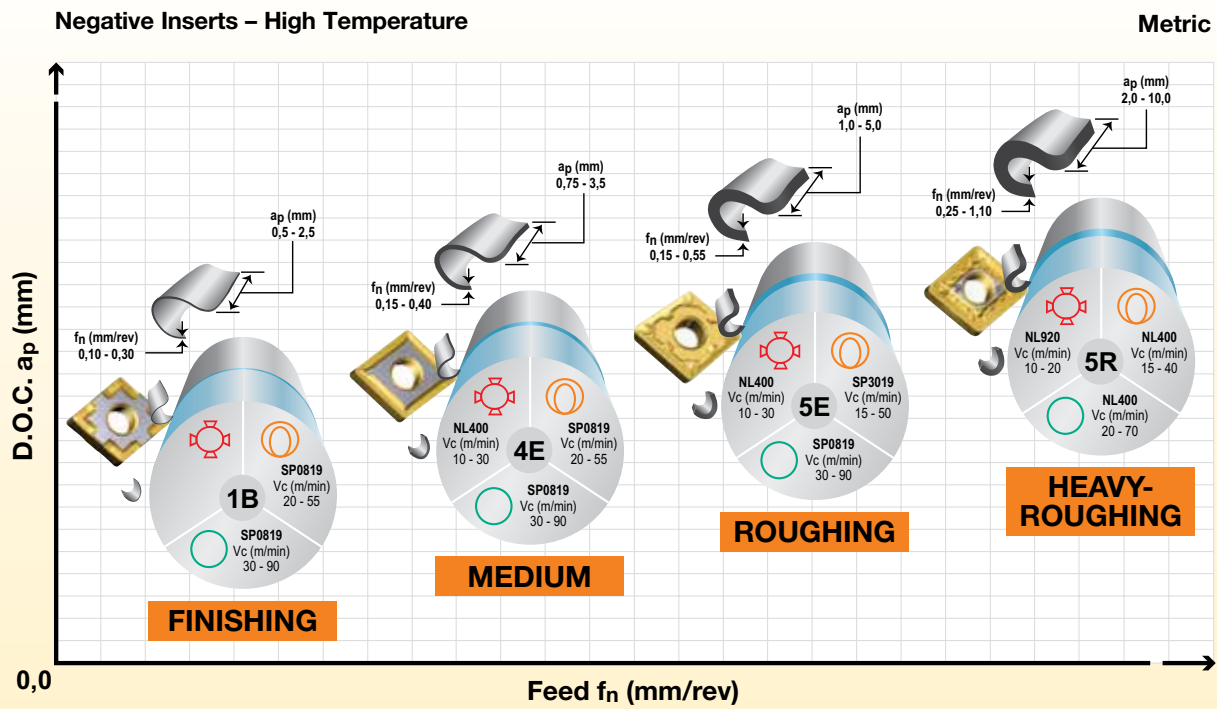


Please note the above recommended cutting speeds, geometries and grades are for guidance only.
For more detailed information, see page 2 (geometry technical information & grade technical information).



Please note the above recommended cutting speeds, geometries and grades are for guidance only.
For more detailed information, see page 2 (geometry technical information & grade technical information).

Key	Interrupted cut	Varying depth of cut	Good condition



Please note the above recommended cutting speeds, geometries and grades are for guidance only.
For more detailed information, see page 2 (geometry technical information & grade technical information).

SP0819



Coating Type: PVD

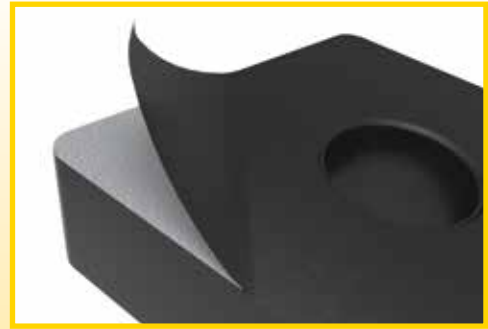
A very wear resistant micro grain substrate with a new generation of TiAlN coating. First choice to machine difficult to machine materials, including PH Stainless Steel. Requires higher cutting speeds in finishing and medium operations, with stable conditions and clean material.

Available in the following geometries:

Finishing: 1B

Finishing-Light Roughing: 3F

Semi Finishing – Light Roughing: 4E



SP0819	Application Range											MAX	DRY	Cutting speed	
	01	05	10	15	20	25	30	35	40	45	50			m/min	
	Vc min		Vc max												
P	•	•										•	•	80	450
M		•	•									•		75	315
K															
N	•	•										•	•	275	975
S	•	•										•		25	90
H	•	•										•		65	140

Recommended • Acceptable •

SP3019



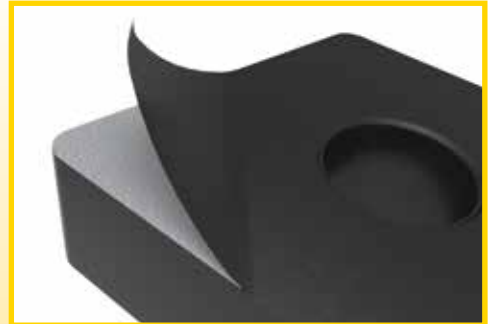
Coating Type: PVD

A unique substrate combining wear resistance and toughness in one, and with the TiAlN coating, makes this grade the ideal combination where edge security is of utmost importance. Able to machine, Alloyed Steels, Stainless Steels, and High Temperature Alloys

Available in the following geometries:

Roughing: 5E

Medium: 3J



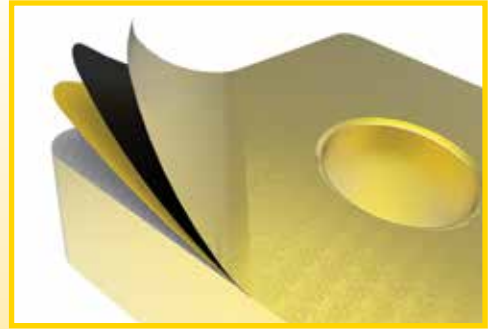
SP3019	Application Range											MAX	DRY	Cutting speed	
	01	05	10	15	20	25	30	35	40	45	50			m/min	
	Vc min		Vc max												
P		•	•									•	•	75	430
M		•	•									•	•	70	290
K															
N															
S		•	•	•								•		20	85
H															

Recommended • Acceptable •

NL400

Coating Type: CVD

A very tough grade for medium and rough machining, primarily on Stainless Steel and Exotic Alloys. Good resistance to thermal diffusion, and accepts light interruption.



Available in the following geometries:

Light Roughing – Semi-Finishing: 4E

Roughing: 4T

Single Sided Heavy Roughing: 5R

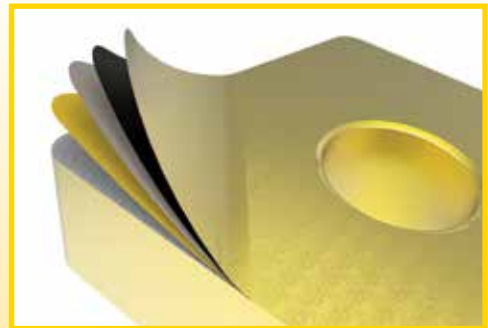
NL400	Application Range										MAX	DRY	Cutting speed		
	01	05	10	15	20	25	30	35	40	45			50	m/min	
													Vc min	Vc max	
P												☞	☞	50	360
M												☞		50	245
K															
N															
S												☞		15	70
H															

Recommended ☞ Acceptable *

NL920

Coating Type: CVD

A fine grain but tough grade, with a high degree of edge security on Steels and Stainless Steels. Performs well on rough and heavy machining applications, including interrupted applications.



Available in the following geometries:

Light-Medium: 2N

Roughing: 4T

Sing Sided Heavy Roughing: 5R

Medium – Roughing: -73

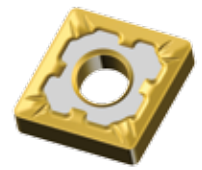
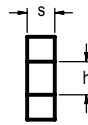
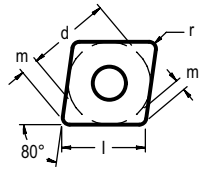
Medium – Roughing: -T

NL920	Application Range										MAX	DRY	Cutting speed		
	01	05	10	15	20	25	30	35	40	45			50	m/min	
													Vc min	Vc max	
P												☞	☞	45	225
M												☞		40	155
K												☞	☞	70	225
N															
S												☞		15	45
H															

Recommended ☞ Acceptable *



CNMG-5E
5E Geometry

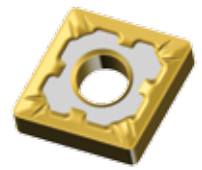
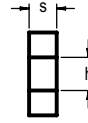
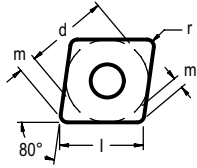


Order Number	Description	Grade	Dimensions (mm)					Material	Application
			d	l	S	re	h		
5674472	CNMG120408E-5E	SP0819	12.70	12.90	4.76	0.80	5.16		Roughing
5681367	CNMG120408E-5E	SP3019	12.70	12.90	4.76	0.80	5.16		Roughing
5690577	CNMG120408E-5E	NL400	12.70	12.90	4.76	0.80	5.16		Roughing
5674473	CNMG120412E-5E	SP0819	12.70	12.90	4.76	1.20	5.16		Roughing
5674796	CNMG120412E-5E	SP3019	12.70	12.90	4.76	1.20	5.16		Roughing
5690578	CNMG120412E-5E	NL400	12.70	12.90	4.76	1.20	5.16		Roughing
5681680	CNMG120416E-5E	SP0819	12.70	12.90	4.76	1.60	5.16		Roughing
5674726	CNMG120416E-5E	SP3019	12.70	12.90	4.76	1.60	5.16		Roughing
5690579	CNMG120416E-5E	NL400	12.70	12.90	4.76	1.60	5.16		Roughing

Material Guide – Key to Recommended Inserts

Material Designation

- Unalloyed Steels
- Alloyed Steels
- Stainless Steels
- PH Stainless
- Cast Irons
- Aluminum & Alloys
- High Temp. Alloys
- Hard Materials


CNMG-5E
5E Geometry


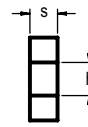
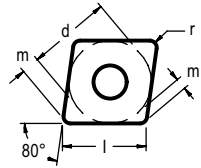
Order Number	Description	Grade	Dimensions (mm)					Material	Application
			d	l	S	rε	h		
5681682	CNMG160608E-5E	SP0819	15.88	16.10	6.35	0.80	6.35	◆◆◆◆	Roughing
5674590	CNMG160608E-5E	SP3019	15.88	16.10	6.35	0.80	6.35	◆◆◆◆	Roughing
5690580	CNMG160608E-5E	NL400	15.88	16.10	6.35	0.80	6.35	◆◆◆◆	Roughing
5681683	CNMG160612E-5E	SP0819	15.88	16.10	6.35	1.20	6.35	◆◆◆◆	Roughing
5674741	CNMG160612E-5E	SP3019	15.88	16.10	6.35	1.20	6.35	◆◆◆◆	Roughing
5690581	CNMG160612E-5E	NL400	15.88	16.10	6.35	1.20	6.35	◆◆◆◆	Roughing
5681681	CNMG160616E-5E	SP0819	15.88	16.10	6.35	1.60	6.35	◆◆◆◆	Roughing
5681377	CNMG160616E-5E	SP3019	15.88	16.10	6.35	1.60	6.35	◆◆◆◆	Roughing
5690582	CNMG160616E-5E	NL400	15.88	16.10	6.35	1.60	6.35	◆◆◆◆	Roughing
5681694	CNMG160624E-5E	SP0819	15.88	16.10	6.35	2.40	6.35	◆◆◆◆	Roughing
5674591	CNMG160624E-5E	SP3019	15.88	16.10	6.35	2.40	6.35	◆◆◆◆	Roughing
5690583	CNMG160624E-5E	NL400	15.88	16.10	6.35	2.40	6.35	◆◆◆◆	Roughing

Material Guide – Key to Recommended Inserts
Material Designation

◆ P Unalloyed Steels
 ◆ P Alloyed Steels
 ◆ M Stainless Steels
 ◆ M PH Stainless
 ◆ K Cast Irons
 ◆ N Aluminum & Alloys
 ◆ S High Temp. Alloys
 ◆ H Hard Materials

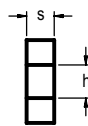
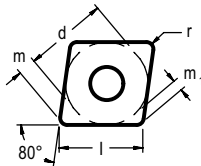


CNMG-5E
5E Geometry



Order Number	Description	Grade	Dimensions (mm)					Material	Application
			d	l	S	re	h		
5681363	CNMG190612E-5E	SP0819	19.05	19.40	6.35	1.20	7.92		Roughing
5681378	CNMG190612E-5E	SP3019	19.05	19.40	6.35	1.20	7.92		Roughing
5690584	CNMG190612E-5E	NL400	19.05	19.40	6.35	1.20	7.92		Roughing
5681687	CNMG190616E-5E	SP0819	19.05	19.40	6.35	1.60	7.92		Roughing
5681380	CNMG190616E-5E	SP3019	19.05	19.40	6.35	1.60	7.92		Roughing
5690585	CNMG190616E-5E	NL400	19.05	19.40	6.35	1.60	7.92		Roughing
5681688	CNMG190624E-5E	SP0819	19.05	19.40	6.35	2.40	7.92		Roughing
5681381	CNMG190624E-5E	SP3019	19.05	19.40	6.35	2.40	7.92		Roughing
5690586	CNMG190624E-5E	NL400	19.05	19.40	6.35	2.40	7.92		Roughing

CNMG-5E
5E Geometry

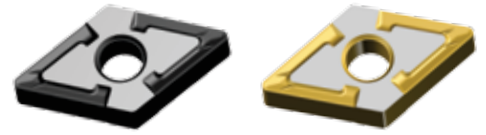
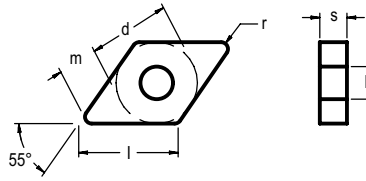


Order Number	Description	Grade	Dimensions (mm)					Material	Application
			d	l	S	re	h		
5681356	CNMG250924E-5E	SP3019	25.40	25.79	9.53	2.40	9.12		Roughing
5690587	CNMG250924E-5E	NL400	25.40	25.79	9.53	2.40	9.12		Roughing
5690588	CNMG250924E-5E	NL920	25.40	25.79	9.53	2.40	9.12		Roughing

Material Guide – Key to Recommended Inserts

Material Designation

- P Unalloyed Steels
- P Alloyed Steels
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- K Cast Irons
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- H Hard Materials


DNMG-5E
5E Geometry


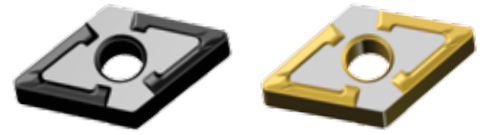
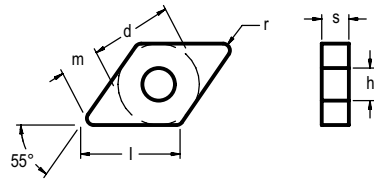
Order Number	Description	Grade	Dimensions (mm)					Material	Application
			d	l	S	rε	h		
5681360	DNMG150408E-5E	SP0819	12.70	15.50	4.76	0.80	5.16		Roughing
5681362	DNMG150408E-5E	SP3019	12.70	15.50	4.76	0.80	5.16		Roughing
5690589	DNMG150408E-5E	NL400	12.70	15.50	4.76	0.80	5.16		Roughing
5681389	DNMG150412E-5E	SP0819	12.70	15.50	4.76	1.20	5.16		Roughing
5681364	DNMG150412E-5E	SP3019	12.70	15.50	4.76	1.20	5.16		Roughing
5690590	DNMG150412E-5E	NL400	12.70	15.50	4.76	1.20	5.16		Roughing
5681368	DNMG150416E-5E	SP0819	12.70	15.50	4.76	1.60	5.16		Roughing
5681382	DNMG150416E-5E	SP3019	12.70	15.50	4.76	1.60	5.16		Roughing
5690591	DNMG150416E-5E	NL400	12.70	15.50	4.76	1.60	5.16		Roughing

Material Guide – Key to Recommended Inserts
Material Designation

Unalloyed Steels
 Alloyed Steels
 Stainless Steels
 PH Stainless
 Cast Irons
 Aluminum & Alloys
 High Temp. Alloys
 Hard Materials



DNMG-5E
5E Geometry

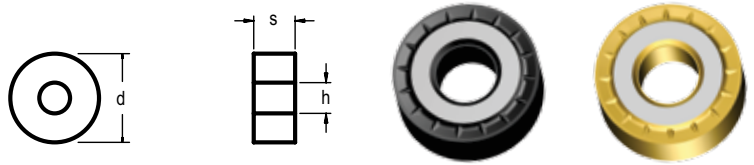


Order Number	Description	Grade	Dimensions (mm)					Material	Application
			d	l	S	re	h		
5681369	DNMG150608E-5E	SP0819	12.70	15.50	6.35	0.80	5.16		Roughing
5674589	DNMG150608E-5E	SP3019	12.70	15.50	6.35	0.80	5.16		Roughing
5690592	DNMG150608E-5E	NL400	12.70	15.50	6.35	0.80	5.16		Roughing
5674818	DNMG150612E-5E	SP0819	12.70	15.50	6.35	1.20	5.16		Roughing
5681412	DNMG150612E-5E	SP3019	12.70	15.50	6.35	1.20	5.16		Roughing
5690593	DNMG150612E-5E	NL400	12.70	15.50	6.35	1.20	5.16		Roughing
5681361	DNMG150616E-5E	SP0819	12.70	15.50	6.35	1.60	5.16		Roughing
5674450	DNMG150616E-5E	SP3019	12.70	15.50	6.35	1.60	5.16		Roughing
5690594	DNMG150616E-5E	NL400	12.70	15.50	6.35	1.60	5.16		Roughing

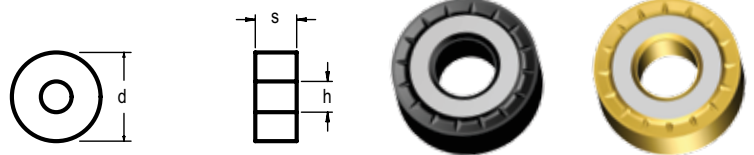
Material Guide – Key to Recommended Inserts

Material Designation

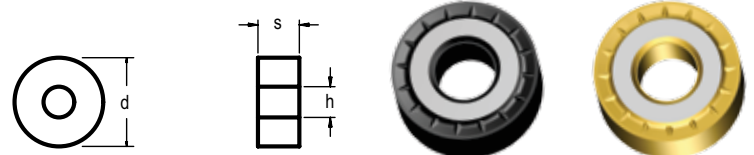
Unalloyed Steels
 Alloyed Steels
 Stainless Steels
 PH Stainless
 Cast Irons
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 High Temp. Alloys
 Hard Materials


RNMG-5E
5E Geometry


Order Number	Description	Grade	Dimensions (mm)					Material	Application
			d	l	S	rε	h		
5681699	RNMG120400E-5E	SP0819	12.70	-	4.76	-	5.16		Roughing
5681351	RNMG120400E-5E	SP3019	12.70	-	4.76	-	5.16		Roughing
5690574	RNMG120400E-5E	NL400	12.70	-	4.76	-	5.16		Roughing

RNMG-5E
5E Geometry


Order Number	Description	Grade	Dimensions (mm)					Material	Application
			d	l	S	rε	h		
5681352	RNMG150600E-5E	SP0819	15.88	-	6.35	-	6.35		Roughing
5681385	RNMG150600E-5E	SP3019	15.88	-	6.35	-	6.35		Roughing
5690575	RNMG150600E-5E	NL400	15.88	-	6.35	-	6.35		Roughing

RNMG-5E
5E Geometry


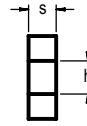
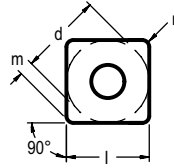
Order Number	Description	Grade	Dimensions (mm)					Material	Application
			d	l	S	rε	h		
5681366	RNMG190600E-5E	SP0819	19.05	-	6.35	-	7.92		Roughing
5681697	RNMG190600E-5E	SP3019	19.05	-	6.35	-	7.92		Roughing
5690576	RNMG190600E-5E	NL400	19.05	-	6.35	-	7.92		Roughing

Material Guide – Key to Recommended Inserts
Material Designation

Unalloyed Steels
 Alloyed Steels
 Stainless Steels
 PH Stainless
 Cast Irons
 Aluminum & Alloys
 High Temp. Alloys
 Hard Materials



SNMG-5E
5E Geometry

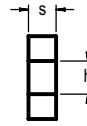
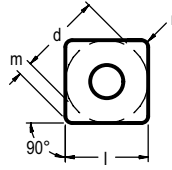


Order Number	Description	Grade	Dimensions (mm)					Material	Application
			d	l	S	r ϵ	h		
5681388	SNMG120408E-5E	SP0819	12.70	12.70	4.76	0.80	5.16		Roughing
5681692	SNMG120408E-5E	SP3019	12.70	12.70	4.76	0.80	5.16		Roughing
5690563	SNMG120408E-5E	NL400	12.70	12.70	4.76	0.80	5.16		Roughing
5681357	SNMG120412E-5E	SP0819	12.70	12.70	4.76	1.20	5.16		Roughing
5681693	SNMG120412E-5E	SP3019	12.70	12.70	4.76	1.20	5.16		Roughing
5690564	SNMG120412E-5E	NL400	12.70	12.70	4.76	1.20	5.16		Roughing
5681358	SNMG120416E-5E	SP0819	12.70	12.70	4.76	1.60	5.16		Roughing
5681695	SNMG120416E-5E	SP3019	12.70	12.70	4.76	1.60	5.16		Roughing
5690565	SNMG120416E-5E	NL400	12.70	12.70	4.76	1.60	5.16		Roughing

Material Guide – Key to Recommended Inserts

Material Designation

- Unalloyed Steels
 Alloyed Steels
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 Cast Irons
 Aluminum & Alloys
 High Temp. Alloys
 Hard Materials


SNMG-5E
5E Geometry


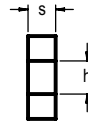
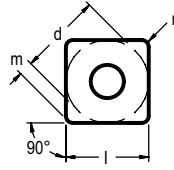
Order Number	Description	Grade	Dimensions (mm)					Material	Application
			d	l	S	r ϵ	h		
5681359	SNMG150608E-5E	SP0819	15.88	15.88	6.35	0.80	6.35		Roughing
5681696	SNMG150608E-5E	SP3019	15.88	15.88	6.35	0.80	6.35		Roughing
5690566	SNMG150608E-5E	NL400	15.88	15.88	6.35	0.80	6.35		Roughing
5681370	SNMG150612E-5E	SP0819	15.88	15.88	6.35	1.20	6.35		Roughing
5681413	SNMG150612E-5E	SP3019	15.88	15.88	6.35	1.20	6.35		Roughing
5690567	SNMG150612E-5E	NL400	15.88	15.88	6.35	1.20	6.35		Roughing
5681371	SNMG150616E-5E	SP0819	15.88	15.88	6.35	1.60	6.35		Roughing
5681414	SNMG150616E-5E	SP3019	15.88	15.88	6.35	1.60	6.35		Roughing
5690568	SNMG150616E-5E	NL400	15.88	15.88	6.35	1.60	6.35		Roughing
5681372	SNMG150624E-5E	SP0819	15.88	15.88	6.35	2.40	6.35		Roughing
5681415	SNMG150624E-5E	SP3019	15.88	15.88	6.35	2.40	6.35		Roughing
5690569	SNMG150624E-5E	NL400	15.88	15.88	6.35	2.40	6.35		Roughing

Material Guide – Key to Recommended Inserts
Material Designation

Unalloyed Steels
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 High Temp. Alloys
 Hard Materials

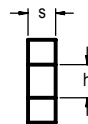
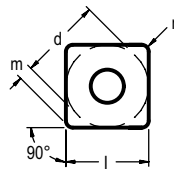


SNMG-5E
5E Geometry



Order Number	Description	Grade	Dimensions (mm)					Material	Application
			d	l	S	r ϵ	h		
5681345	SNMG190612E-5E	SP0819	19.05	19.05	6.35	1.20	7.94		Roughing
5681383	SNMG190612E-5E	SP3019	19.05	19.05	6.35	1.20	7.94		Roughing
5690570	SNMG190612E-5E	NL400	19.05	19.05	6.35	1.20	7.94		Roughing
5681685	SNMG190616E-5E	SP0819	19.05	19.05	6.35	1.60	7.94		Roughing
5681384	SNMG190616E-5E	SP3019	19.05	19.05	6.35	1.60	7.94		Roughing
5674532	SNMG190616E-5E	NL400	19.05	19.05	6.35	1.60	7.94		Roughing
5681346	SNMG190624E-5E	SP0819	19.05	19.05	6.35	1.60	7.94		Roughing
5681379	SNMG190624E-5E	SP3019	19.05	19.05	6.35	2.40	7.94		Roughing
5690571	SNMG190624E-5E	NL400	19.05	19.05	6.35	2.40	7.94		Roughing

SNMG-5E
5E Geometry

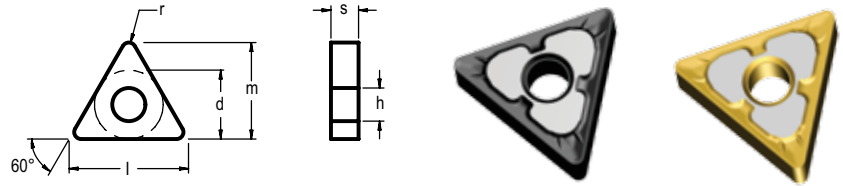


Order Number	Description	Grade	Dimensions (mm)					Material	Application
			d	l	S	r ϵ	h		
5681365	SNMG250924E-5E	SP3019	25.40	25.40	9.53	2.40	9.12		Roughing
5690572	SNMG250924E-5E	NL400	25.40	25.40	9.53	2.40	9.12		Roughing
5690573	SNMG250924E-5E	NL920	25.40	25.40	9.53	2.40	9.12		Roughing

Material Guide – Key to Recommended Inserts

Material Designation

- Unalloyed Steels
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- High Temp. Alloys
- Hard Materials


TNMG-5E
 5E Geometry


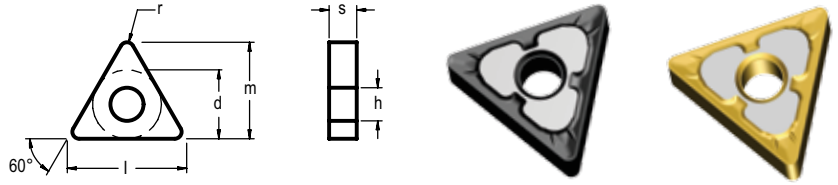
Order Number	Description	Grade	Dimensions (mm)					Material	Application
			d	l	S	rε	h		
5674533	TNMG160408E-5E	SP0819	9.53	16.50	4.76	0.80	3.81		Roughing
5681355	TNMG160408E-5E	SP3019	9.53	16.50	4.76	0.80	3.81		Roughing
5690595	TNMG160408E-5E	NL400	9.53	16.50	4.76	0.80	3.81		Roughing
5681373	TNMG160412E-5E	SP0819	9.53	16.50	4.76	1.20	3.81		Roughing
5681698	TNMG160412E-5E	SP3019	9.53	16.50	4.76	1.20	3.81		Roughing
5690596	TNMG160412E-5E	NL400	9.53	16.50	4.76	1.20	3.81		Roughing
5681374	TNMG160416E-5E	SP0819	9.53	16.50	4.76	1.60	3.81		Roughing
5681690	TNMG160416E-5E	SP3019	9.53	16.50	4.76	1.60	3.81		Roughing
5690544	TNMG160416E-5E	NL400	9.53	16.50	4.76	1.60	3.81		Roughing

Material Guide – Key to Recommended Inserts
Material Designation

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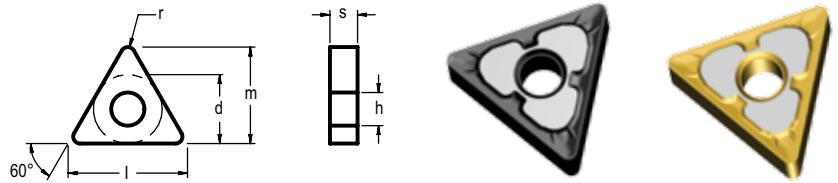


TNMG-5E
5E Geometry



Order Number	Description	Grade	Dimensions (mm)					Material	Application
			d	l	S	re	h		
5681347	TNMG220408E-5E	SP0819	12.70	22.00	4.76	0.80	5.16		Roughing
5681343	TNMG220408E-5E	SP3019	12.70	22.00	4.76	0.80	5.16		Roughing
5690545	TNMG220408E-5E	NL400	12.70	22.00	4.76	0.80	5.16		Roughing
5681375	TNMG220412E-5E	SP0819	12.70	22.00	4.76	1.20	5.16		Roughing
5681344	TNMG220412E-5E	SP3019	12.70	22.00	4.76	1.20	5.16		Roughing
5690546	TNMG220412E-5E	NL400	12.70	22.00	4.76	1.20	5.16		Roughing
5681376	TNMG220416E-5E	SP0819	12.70	22.00	4.76	1.60	5.16		Roughing
5681349	TNMG220416E-5E	SP3019	12.70	22.00	4.76	1.60	5.16		Roughing
5690547	TNMG220416E-5E	NL400	12.70	22.00	4.76	1.60	5.16		Roughing

TNMG-5E
5E Geometry

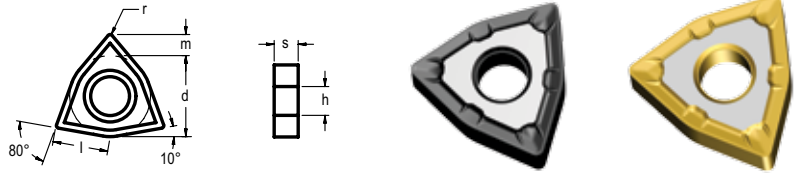


Order Number	Description	Grade	Dimensions (mm)					Material	Application
			d	l	S	re	h		
5681350	TNMG330924E-5E	SP3019	19.05	33.50	9.53	2.40	7.92		Roughing
5690548	TNMG330924E-5E	NL400	19.05	33.50	9.53	2.40	7.92		Roughing
5690549	TNMG330924E-5E	NL920	19.05	33.50	9.53	2.40	7.92		Roughing

Material Guide – Key to Recommended Inserts

Material Designation

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- Hard Materials


WNMG-5E
 5E Geometry


Order Number	Description	Grade	Dimensions (mm)					Material	Application
			d	l	S	r ϵ	h		
5681348	WNMG080408E-5E	SP0819	12.70	8.69	4.76	0.80	5.16		Roughing
5681386	WNMG080408E-5E	SP3019	12.70	8.69	4.76	0.80	5.16		Roughing
5690560	WNMG080408E-5E	NL400	12.70	8.69	4.76	0.80	5.16		Roughing
5681686	WNMG080412E-5E	SP0819	12.70	8.69	4.76	1.20	5.16		Roughing
5681387	WNMG080412E-5E	SP3019	12.70	8.69	4.76	1.20	5.16		Roughing
5690561	WNMG080412E-5E	NL400	12.70	8.69	4.76	1.20	5.16		Roughing
5681353	WNMG080416E-5E	SP0819	12.70	8.69	4.76	1.60	5.16		Roughing
5681689	WNMG080416E-5E	SP3019	12.70	8.69	4.76	1.60	5.16		Roughing
5690562	WNMG080416E-5E	NL400	12.70	8.69	4.76	1.60	5.16		Roughing

Material Guide – Key to Recommended Inserts
Material Designation

Unalloyed Steels
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 Cast Irons
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 Hard Materials

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