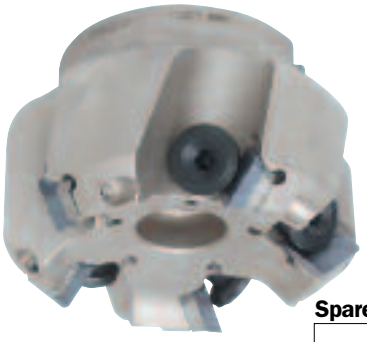
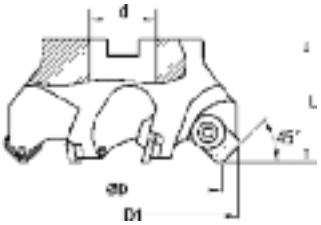
INDEXA-SEIKI XP-45C 'Face Hog' Milling Cutters

Super Positive 45° approach milling cutter, angle decreases cutting forces and allows a quick feed in a limited capacity machine. Clamp style insert pocket with shim seats to protect the body in case of accident. Plasma Ion coating offers longer tool life and greater hardness that is more resistant to wear.
Through coolant as standard.

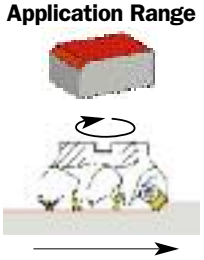
XP XTRA PLASMA COATED BODY





Feed Per Tooth (mm)
0.05 - 0.20
See Page 167 for Cutting Speed Information

Application Range

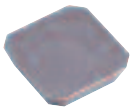


Dia (mm)	D1	d	L	Z	Order Code IND-139	Price/1 TB
63	76	22	50	5	-7600K	8755.00
80	93	27	50	6	-7620K	11279.00
100	113	32	50	6	-7640K	14935.00
125	138	40	63	7	-7660K	16995.00
160	173	40	63	8	-7680K	22660.00

Spares to suit

Arbor Screw		Shim		Shim Screw		Clamp Screw		Hex Key	
Order Code IND-107								Order Code KEN-601	
Price/1 TB		Price/1 TB		Price/1 TB		Price/1 TB		Price/1 TB	
-5353K	139.00								
-5354K	139.00								
-5356K	263.00	-4960K	335.00	-5284K	77.00	-5290K	963.00	-1400K	1879.00
-5358K	263.00								

YAMALOY YAMALOY TOOLING · JAPAN



Inserts

Designation	Grade	To Suit	Order Code YML-120	Price/1 TB
SEKN 1203 AFTN	K20	Face Hog	-4517V	386.00
	QP25		-4527P	386.00
	QP40		-4527S	386.00
SEKR 1203 AFTN	K20	Face Hog	-4617V	450.00
	QP25C		-4627W	455.00

Insert Grade Description

K20 **(K20)** Micrograin uncoated. For cast irons, aluminium alloys, other non-ferrous materials including titaniums and nickel alloys.

QP25 **(P25)** Uncoated. For medium and finish milling of steels.

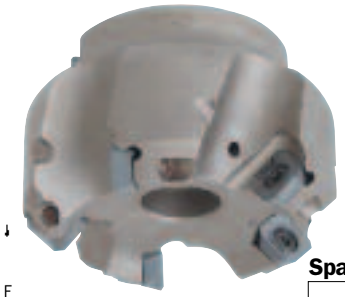
QP25C **(P10-P35)** CVD coated. Milling grade for steels and some stainless steels.

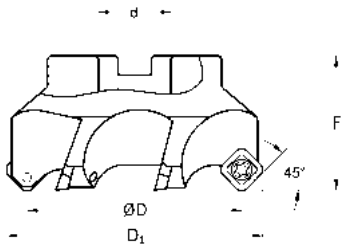
QP40 **(P40)** Uncoated. For rough medium and finish milling of tough steels and stainless steels including interrupted cutting.

INDEXA-SEIKI XP-45C 'Hi Shear' Milling Cutters

Super Positive 45° approach milling cutter, angle decreases cutting forces and allows a quick feed in a limited capacity machine. Torx screws allow for good chip evacuation. Plasma Ion coating offers longer tool life and greater hardness that is more resistant to wear.
Through coolant as standard.

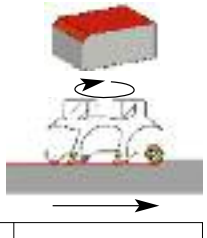
XP XTRA PLASMA COATED BODY





Feed Per Tooth (mm)
0.05 - 0.20
See Page 167 for Cutting Speed Information

Application Range



Dia (mm)	D1	d	F	Z	Order Code IND-139	Price/1 TB
63	75	22	50	5	-7400K	8858.00
80	92	27	50	6	-7420K	11500.00
100	112	32	50	6	-7440K	13389.00
160	172	40	63	8	-7460K	23587.00

Spares to suit

Arbor Screw						Clamp Screw		Driver	
Order Code IND-107								Order Code KEN-603	
Price/1 TB		Price/1 TB		Price/1 TB		Price/1 TB		Price/1 TB	
-5353K	139.00								
-5354K	139.00								
-5356K	263.00					-5352K	160.00	-0220D	549.00
-5358K	263.00								

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Inserts

Designation	Grade	Order Code YML-120	Price/1 TB
SEHT 1204 AFTN	K20	-4430V	420.00
	QP25C	-4430W	592.00
SEHW 1204 AFTN-05	K20	-4445V	420.00
	QP25C	-4445W	592.00

Insert Grade Description

K20 **(K20)** Micrograin uncoated. For cast irons, aluminium alloys, other non-ferrous materials including titaniums and nickel alloys.

QP25C **(P10-P35)** CVD coated. Milling grade for steels and some stainless steels.

PRODUCTS ARE ONLY AVAILABLE VIA YOUR DISTRIBUTOR

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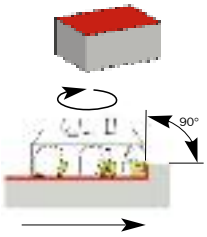
XP-90C '4 Square' 90° Shell Mills

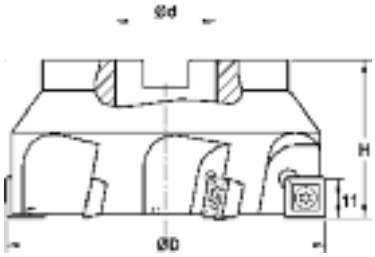
Positive 90° cutter with an exact angle of 90°, square insert allowing depth passes and high feed per teeth. Torx style insert pocket with shim seats to protect the body in case of accident. Plasma Ion coating offers longer tool life and greater hardness that is more resistant to wear.
Through coolant as standard.

XP XTRA PLASMA COATED BODY

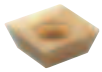
Feed Per Tooth (mm)
0.04 - 0.30
See Page 167 for Cutting Speed Information

Application Range





SDMT 12



For Inserts See Below

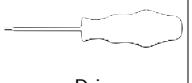
Spares to suit


Arbor Screw


Shim


Shim Pin


Clamp Screw


Driver

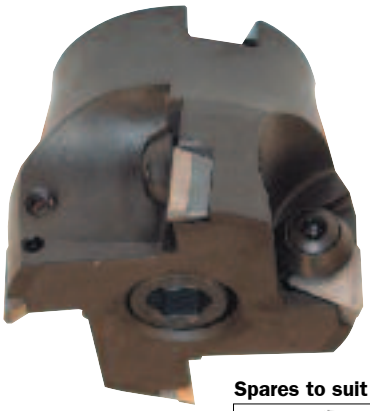
Order Code KEN-603

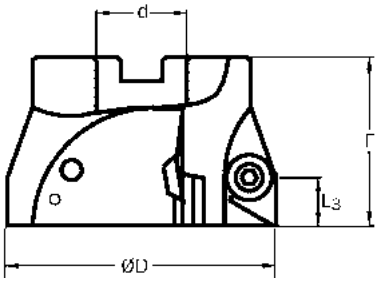
XP-90C '4 Square' 90° Shell Mills for SDMT 12 inserts

Dia (mm)	d	H	Z	Weight each	Order Code IND-139	Price/1 TB		Price/1 TB		Price/1 TB		Price/1 TB		Price/1 TB
63	22	40	5	459g	-7500K	8343.00	-5354K	139.00						
80	27	50	6	999g	-7520K	11227.00	-5354K	139.00						
100	32	50	7	1669g	-7540K	14678.00	-5356K	263.00	-2490K	258.00	-1570K	308.00	-3400K	102.00	-0150D	520.00
125	40	63	7	3533g	-7560K	19500.00	-5357K	304.00								

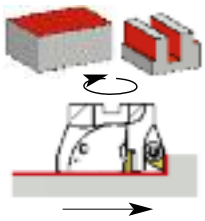
'Tri Square' 90° Shell Mills

Uses top clamping triangular inserts to produce a 90° shoulder at the edge of a milled face. This is of major benefit when taking a number of cuts across a face as the shoulder produced is without steps.



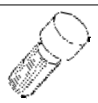


Application Range



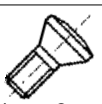
Insert Size	Feed Per Tooth (Fz) mm
TPKN 16	0.05 - 0.20
TPKN 22	0.10 - 0.30
See Page 167 for Cutting Speed Information	

Spares to suit


Arbor Screw


Shim


Shim Pin

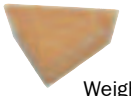

Clamp Screw


Clamp Ring

For TPKN 1603

Dia (mm)	d	F	L3	Z	Weight each	Order Code IND-139	Price/1 TB		Price/1 TB		Price/1 TB		Price/1 TB		Price/1 TB
63	27	50	13	4	655g	-3400K	9399.00	-5354K	139.00							
80	32	50	13	5	1200g	-3420K	10815.00	-5355K	102.00	-5360K	304.00	-5362K	77.00	-0050K	82.00	-0440K	82.00
100	40	50	13	6	1746g	-3440K	14008.00	-5357K	304.00								

For TPKN 2204



Order Code **IND-107**

Dia (mm)	d	F	L3	Z	Weight each	Order Code IND-139	Price/1 TB		Price/1 TB		Price/1 TB		Price/1 TB		Price/1 TB
100	40	50	18	5	1546g	-3460K	14008.00								
125	40	63	18	6	2777g	-3480K	18540.00	-5357K	304.00	-5361K	335.00	-5380K	77.00	-0060K	82.00	-0500K	93.00

Hexagon Keys

To Suit	Order Code KEN-601	Price/1 TB
Clamp Wrench (Insert 1603)	-1400K	1879.00
Clamp Wrench (Insert 2204)	-1500K	2370.00

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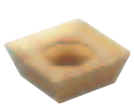
Inserts

Designation	Grade	To Suit	Order Code YML-120	Price/1 TB
TPKN 1603 PPR	K20	Tri-Sq	-8428V	361.00
TPKN 1603 PPTR	QP25 QP40	Tri-Sq	-8438P -8438S	361.00 361.00
TPKN 2204 PDR	K20	Tri-Sq	-8458V	373.00
TPKN 2204 PDTR	QP25 QP40	Tri-Sq	-8468P -8468S	438.00 438.00
SDMT 12T308	QX530	4 Sq	-4280E	444.00


TPKN


SDMT

Insert Grade Selection

K20 (**K20**) Micrograin uncoated. For cast irons, aluminium alloys and other non-ferrous materials including titaniums and nickel alloys.

QP25 (**P25**) Uncoated. For medium and finish milling of steels.

QP40 (**P40**) Uncoated. For rough medium and finish milling of tough steels and stainless steels including interrupted cutting.

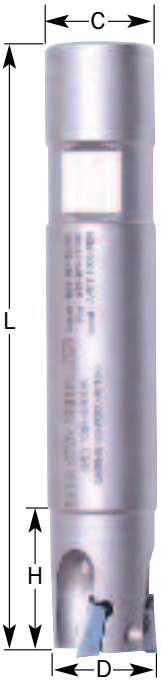
QX530 **(P20-P40 M20-M30)** Coated. Turning grade for steels, cast steels and stainless steels. A good general purpose steel grade for roughing.

PRODUCTS ARE ONLY AVAILABLE VIA YOUR DISTRIBUTOR

INDEXA-SEIKI

XP-90C 'APT' 90° Shell Mills

Positive 90° approach milling cutter, using size 10/16 inserts allowing depth passes and high feed per teeth. Torx screw allows for good chip evacuation. Plasma Ion coating offers longer tool life and greater hardness that is more resistant to wear. Through coolant as standard.



XP XTRA PLASMA COATED BODY

Insert Size	Feed Per Tooth (Fz) mm
APXT 10	0.05 - 0.20
APXT 16	0.10 - 0.30
See Page 167 for Cutting speed Information	

XP-90C End Mills For AP_T 10 Inserts

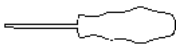
D	z	H	C	L	Inserts	Order Code IND-139	Price/1 TB
10	1	20	10	80	APKT1003 or APXT1003	-4800K	6283.00
12	1	20	12	80		-4820K	7545.00
16	2	25	16	90		-4860K	8575.00
20	3	25	20	110		-4900K	9682.00

XP-90C End Mills For AP_T 16 Inserts

D	z	H	C	L	Inserts	Order Code IND-139	Price/1 TB
20	1	37	20	115	APKT1604 or APXT1604	-5000K	8549.00
25	2	40	25	117		-5020K	8755.00
32	3	40	25	126		-5040K	10918.00
40	4	50	32	136		-5060K	15759.00

For Inserts See Below



Spares	Arbor Screw		Clamp Screw		Flag Torx Key		Driver	
To Suit			Order Code IND-107				Order Code KEN-603	
		Price/1 TB		Price/1 TB		Price/1 TB		Price/1 TB
10-20 Dia (APKT 10)	-		-5240K	386.00	-		-0080D	494.00
20-25 Dia (APKT 16)	-		-5270K	386.00	-5150K	67.00	-0150D	520.00
32-40 Dia (APKT 16)	-		-5270K	386.00	-5150K	67.00	-0150D	520.00

XP-90C 'APT' 90° Shell Mills

Positive 90° approach milling cutter, using size 16 inserts allowing depth passes and high feed per teeth. Torx screw allows for good chip evacuation. Plasma Ion coating offers longer tool life and greater hardness that is more resistant to wear. Through coolant as standard.

XP XTRA PLASMA COATED BODY

Feed Per Tooth (Fz) mm
0.10 - 0.30
See Page 167 for Cutting speed Information

XP-90C Shell Mills For APKT 16 Inserts

D	z	B	C	L	Inserts	Order Code IND-139	Price/1 TB
50	4	22	10.4	50	APKT1604 or APXT1604	-3920K	10815.00
63	5	22	10.4	50		-3940K	14935.00
80	6	27	12.7	50		-3960K	18798.00
100	7	32	14.4	63		-3980K	22145.00




Spares	Arbor Screw		Clamp Screw		Flag Torx Key		Driver	
To Suit	Order Code IND-107		Order Code IND-107				Order Code KEN-603	
		Price/1 TB		Price/1 TB				Price/1 TB
50 & 63 Dia	-5354K	139.00						
80 Dia (APKT 16)	-5354K	139.00	-5270K	386.00			-0150D	520.00
100 Dia	-5355K	102.00						

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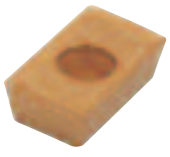
Insert Grade Selection

Designation	Grade	To Suit	Weight each	Order Code YML-120	Price/1 TB
APKT 1003 PDR	QK25C	APT Shell Mills	27g	-0028X	385.00
	QP30P		35g	-0028W	325.00
APXT 1604 PDTR	K20 QK25C QP30P	Combination End, APT Shell Mills	85g	-0031V	385.00
			92g	-0030X	562.00
			85g	-0030W	415.00

Insert Grade Description



K20 (**K20**) Micrograin uncoated. For cast irons, aluminium alloys, other non-ferrous materials including titaniums and nickel alloys.

QK25C (**K15-K30**) Coated. For milling cast irons.

QP30P (**P10-P35**) PVD coated. Milling grade for steels and some stainless steels.

YAMALOY YAMALOY TOOLING · JAPAN

Speed Recommendations for Yamaloy Milling Inserts

Use the following table with the specific feed rates of the cutter used (found on the specific cutter page). Feed rates may vary according to work material and machine conditions but the following can be used as a general guide.

Steel Group	**Materials** Colour Defines Similar Machineability	Brinell Hardness HB	Rockwell Hardness HRC	Tensile Strength N/mm²	Speed M/min					
					K20	QK25C	QP25/ QP30P	QP30P	QP40	QX530
1.1	Mild, soft and free machining non-alloy low carbon steels	up to 130	-	up to 400	-	-	140 - 200	180 - 250	80 - 50	150 - 200
1.2	Non-alloy, case hardening, structural and low to medium carbon steels	up to 200	-	up to 700	-	-	130 - 180	150 - 230	75 - 110	130 - 180
1.3	Non-alloy, plain and medium carbon steels and castings	up to 260	up to 26	up to 850	-	-	130 - 160	140 - 210	75 - 95	110 - 150
1.4	Generally low to medium alloy steels and castings	up to 260	up to 26	up to 850	-	-	120 - 160	130 - 200	70 - 90	110 - 140
1.5	Medium to high alloy steels, tool steels and castings	from 260 up to 340	from 26 up to 48	from 850 up to 1200	-	-	110 - 150	120 - 180	65 - 85	100 - 120
1.6	Heat treated alloy steels and castings	up to 230	up to 20	from 1200 up to 1500	-	-	80 - 120	110 - 150	60 - 80	70 - 90
2.1	Soft and generally easy to machine ferritic and martensitic stainless steels and castings	up to 290	up to 30	up to 800	-	-	130 - 180	150 - 200	70 - 100	80 - 120
2.2	Medium strength and easy to machine austenitic stainless steels and castings	up to 340	up to 36	up to 1000	-	-	120 - 170	130 - 180	70 - 100	60 - 100
2.3	Hard and generally difficult to machine ferritic and austenitic (duplex) stainless steels and castings	up to 180	-	up to 1200	-	-	-	40 - 50	25 - 40	50 - 90
3.1	Grey cast iron Hardness - soft to medium	from 180 up to 300	-	-	120 - 150	150 - 250	-	-	-	-
3.2	Grey cast iron Hardness - medium to hard	up to 220	-	-	90 - 130	120 - 200	-	-	-	-
3.3	Malleable and nodular iron - soft to medium	from 220 to 300 max	-	-	80 - 110	150 - 250	-	-	-	-
3.4	Malleable and nodular iron - medium to hard	-	-	-	70 - 100	120 - 200	-	-	-	-
4.1	Pure titanium (also pure nickel)	-	-	up to 700	200 - 300	-	-	-	-	-
4.2	Titanium alloys of a medium and hard nature	-	-	up to 900	50 - 80	-	-	-	-	-
4.3	Titanium alloys of a hard and very hard nature	-	-	from 900 up to 1250	20 - 50	-	-	-	-	-
5.1	Heat resistant super alloys including iron based high temperature alloys	-	-	up to 500	15 - 35	-	-	-	-	-
5.2	Heat resistant super alloys, cobalt or nickel based, of a medium to hard nature to machine	-	-	up to 900	15 - 35	-	-	-	-	-
5.3	Heat resistant super alloys, cobalt or nickel based, of a hard or very hard nature to machine	-	-	from 900 up to 1200	20 - 50	-	-	-	-	-
6.1	Copper	-	-	up to 500	250 - 400	-	-	-	-	-
6.2	Brass (alpha - long chip)	-	-	up to 800	200 - 400	-	-	-	-	-
6.3	Brass (beta - short chip) and soft bronze	-	-	up to 800	200 - 800	-	-	-	-	-
6.4	High strength bronze	-	-	up to 1200	50 - 120	-	-	-	-	-
7.1	Unalloyed: aluminium, magnesium & zinc	-	-	up to 150	500 - 900	-	-	-		-
7.2	Aluminium alloys less than 5% Si magnesium and zinc alloys (long chip)	-	-	from 150 up to 300	600 - 900	-	-	-	-	-
7.3	Aluminium alloys 5% to 10% Si	-	-	from 200 up to 500	300 - 600	-	-	-	-	-
7.4	Aluminium alloys above 10% Si (short chip)	-	-	from 200 up to 500	200 - 500	-	-	-	-	-
8.1	Thermoplastics	-	-	-	300 - 700	-	-	-	-	-
8.2	Thermo-setting plastics	-	-	-	300 - 500	-	-	-	-	-
8.3	Reinforced plastics & composite materials	-	-	-	100 - 300	-	-	-	-	-

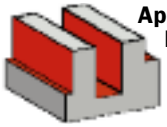
INDEXA-SEIKI

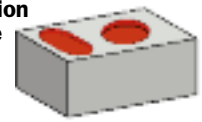
QMC 06 Quad Milling Holder Set

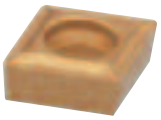
Small diameter Indexable End Mills are taking a CCMT 06 insert. Ideal for use on manual and CNC milling machines where reach and clearance are required.

Dia. (mm)	d	L	L1	L2	Order Code IND-139	Price/1 TB
08	12	120	95	25	-9010K	14420.00
10	12	120	95	25		
12	12	120	95	25		
16	16	120	95	25		

Application Range







Uses **CCMT 06/CCGT 06** inserts.

Feed Per Rev (mm)
0.02 - 0.10

Spares

Description	To Suit	Order Code IND-107	Price/1 TB
Insert Screw	Quad Mill	-5240K	386.00
T8 Torx Key		-5080K	232.00

Insert Grade Selection

Designation	Grade	To Suit	Order Code YML-120	Price/1 TB
CCMT060204-PM	QX500	Quad Mill	-0355A	267.00
	QX520		-0355D	267.00
CCGT060202-AL	K10	Quad Mill	-0121N	385.00
CCGT060204-AL	K10	Quad Mill	-0131N	385.00

Insert Grade Description

QX520 **(P10-P35 M10-M30 K10-K30)** Coated. An excellent general purpose grade for medium roughing on steels, stainless and cast irons.

K10 **(K10)** Uncoated. Used in combination with a high rake geometry for machining aluminium, plastics and other soft non-ferrous materials.

QX500 **(QX500) (P10-P25 Cermet)**. For high speed finishing and light roughing. Will maintain a high class surface finish. Mainly used on steels and can be applied to finishing some stainless steels and cast irons.

Speed & Feed Recommendations for Quad Mills

Specific feed rates may vary according to work material and machine conditions but the following can be used as a general guide.

Steel Group	Materials Colour defines similar machineability	Speed-M/Min						
		Brinell Hardness HB	Rockwell Hardness HRC	Tensile Strength N/mm²	QX500	QX520	QX530	K10
1.1	Mild, soft and free machining non-alloy low carbon steels	up to 130	-	up to 400	200-270	180-350	150-200	
1.2	Non-alloy, case hardening, structural and low to medium carbon steels	up to 200	-	up to 700	180-250	150-320	130-180	
1.3	Non alloy, plain and medium carbon steels and castings	up to 260	up to 26	up to 850	150-220	130-280	110-150	
1.4	Generally low to medium alloy steels and castings	up to 260	up to 26	up to 850	140-210	140-210	110-140	
1.5	Medium to high alloy steels, tool steels and steel castings	from 260 up to 340	from 26 up to 48	from 850 up to 1200	140-200	130-200	100-120	
1.6	Heat treated high alloy steels and castings	from 340 up to 450	from 36 up to 48	from 1200 up to 1500	110-180	100-170	70-90	
2.1	Soft & generally easy to machine Ferritic & Martensitic stainless steels & castings	up to 230	up to 20	up to 800	90-190	110-220		
2.2	Medium strength & reasonable to machine Austenitic stainless steels & castings	up to 290	up to 30	up to 1000	70-160	70-140	60-100	
2.3	Hard & generally difficult to machine Ferritic & Austenitic (duplex) stainless steels & castings	up to 340	up to 36	up to 1200			50-90	
3.1	Grey cast iron Hardness - soft to medium	up to 180	-		175-280	190-400		
3.2	Grey cast iron Hardness - medium to hard	from 180 up to 300	-		160-250	150-300		
3.3	Malleable and Nodular irons - soft to medium	up to 220	-		200-250			
3.4	Malleable and Nodular irons - medium to hard	from 220 up to 300	-		200-250			
6.1	Copper	-	-	up to 500	200-250			100-500
6.2	Brass (Alpha - long chip)	-	-	up to 800	300-500			400-700
6.3	Brass (Beta - short chip) & soft Bronze	-	-	up to 800	300-500			400-700
7.1	Unalloyed: Aluminium, Magnesium & Zinc	-	-	up to 150	300-500			400-600
7.2	Aluminium alloys less than 5% Si Magnesium & Zinc alloys (long chip)	-	-	from 150 up to 300				300-500
7.3	Aluminium alloys 5% to 10% Si	-	-	from 200 up to 500				400-700
7.4	Aluminium alloys above 10% Si (short chip)	-	-	from 200 up to 500				400-700
8.1	Thermoplastics							200-500
8.2	Thermo-setting plastics							
8.3	Reinforced plastics & composite materials							

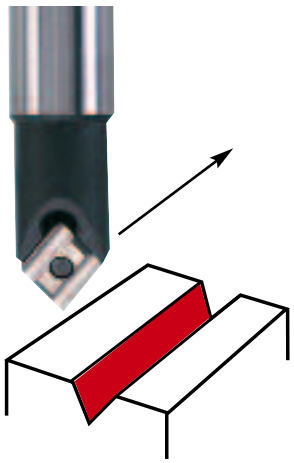
INDEXA-SEIKI Multi-Pro Spot Drills & Chamfer Mills

A spotting drill with all the advantages of indexable inserts - reduced tool maintenance time, increased performance, lower inventory cost and no regrinding requirements. The insert clamping method ensures accurate and secure location with quick change-over times. Multi-pro has a unique geometry which allows cutting over the centre line, using carbide, without chipping of the cutting edge. This versatile tool may be used to 'spot' holes prior to drilling, as a means to guide the drill and keep the hole straight, to keep size and accurately position, relative to the datum.
NB. The 118° inclusive tool is recommended for 'spotting' prior to drilling with 118° point drills. Countersinks may be produced prior to drilling to provide a corner break on a drilled hole, a chamfer conforming to drawing specifications, a lead in for a subsequent tapping operation, or a full countersink to accommodate a screw head. Corner chamfers on edges, contours and bores can be machined as light de-burring operations or full depth chamfers. Multi-pro may be used to produce vee grooves for fluid channels, locations for round components and grip pattern or serrations on jaws and clamp pads.

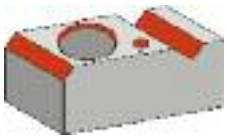
SCM1045C SC1645C SC1630C

Hole Chamfer

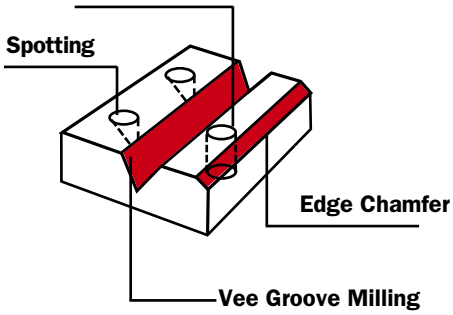
Vee Groove Milling



Application Range



Hole Chamfer



'Multi Pro Mini' - Uses C22 GUX Inserts

Designation	Cutting Diameter	Overall Length	Included Angle	Shank Diameter	Weight each	Order Code IND-139	Price/1 TB
SCM 1045C	8mm	105mm	90°	10mm	78g	-8050K	11845.00

'Multi Pro Standard' - Uses C32 GUX Inserts

Designation	Cutting Diameter	Overall Length	Included Angle	Shank Diameter	Weight each	Order Code IND-139	Price/1 TB
SC 1645C	13mm	110mm	90°	16mm	174g	-8545K	11330.00
SC 1630C	16mm	110mm	118°	16mm	184g	-8530K	11330.00

Insert Grade Description

QM10 **(ISO P10/M10/K10)** Tin Coated Multi-purpose grade for general use, can cut the majority of ferrous and non-ferrous materials used in industry.

QS20 **(ISO P20)** Uncoated Grade for steel and stainless steel application.

QC10 **(ISO K10)** Uncoated Grade for cast irons, aluminiums, and non-ferrous materials.

Inserts

Designation	Grade	To Suit	Order Code YML-122	Price/1 TB
C22 GUX	QM10	Multi-Pro Mini	-0080N	2251.00
C32 GUX	QS20	Multi-Pro	-0102P	1836.00
C32 GUX	QC10	Standard	-0100N	1600.00

Spares

Insert Screw	Order Code IND-107	Price/1 TB
To suit SCM1045C	-3249K	225.00
To suit SC1645C & SC1630C	-4800K	361.00

Speed & Feed Recommendations for Multi-Pro

Group	Materials	Rockwell Hardness HRC	Recommended Grade		Cutting Speed M/min	Type of Operation	Feed/Rev Pro Mini 105mm	Feed/Rev Pro Standard 110mm	Feed/Rev Pro Mini 165mm
1.1 to 1.3	Alloy Steels and castings	from 36 up to 45	QS20	QM10	80~100	Spot Drilling Chamfer Milling	0.020 0.050	0.026 0.070	0.013 0.040
1.4 to 1.6	Tool and die steels	from 45 up to 55	QS20	QM10	55~65	Spot Drilling Chamfer Milling	0.012 0.030	0.016 0.050	0.008 0.020
2.1 to 2.3	Stainless steels	up to 36	QS20	QM10	70~90	Spot Drilling Chamfer Milling	0.020 0.040	0.026 0.060	0.013 0.030
3.1 to 3.4	Cast irons	-	QC10	QM10	100~120	Spot Drilling Chamfer Milling	0.034 0.050	0.045 0.070	0.022 0.040
6.1 to 6.6	Copper alloys brass and bronze	-	QC10	QM10	120~150	Spot Drilling Chamfer Milling	0.034 0.050	0.045 0.070	0.022 0.040
7.1 to 7.4	Aluminium alloys	-	QC10	QM10	120~150	Spot Drilling Chamfer Milling	0.034 0.050	0.045 0.070	0.022 0.040