

INTRODUCTION

Brunswick Tooling Ltd. Part of the OSG Corporation group of companies are specialists in the design and manufacture of high quality cutting tools. All Brunswick Tooling is designed and manufactured in-house to ISO 9001 Standards.

Manufactured in Brighouse West Yorkshire, the product range encompasses Brunswick Reamers, Pre-Ream Cutters, Floating Reamer Holders and Special Tooling (Indexable Insert, Brazed Carbide and H.S.S).

As well as designing and manufacturing new cutting tools, Brunswick Tooling offer a comprehensive regrind service on almost any type of cutting tool, from a standard twist drill to some of the most complex form cutters and high-performance drills.

The company has a policy of continuous development through investing in new machine tools and equipment, product improvement and employee training. This ensures continuity of manufacture of quality high specification tooling.



ADJUSTABLE REAMERS

SIZE RANGE > 7.75 - 32.00MM

Size range availability 7.75mm to 32.00mm diameter with parallel shank. Available in standard working length 70mm or long working length 110mm.

Brunswick precision adjustable carbide tipped reamers have a limited adjustment for wear compensation. The Brunswick reamer will achieve bore tolerances normally associated with boring, grinding and honing.

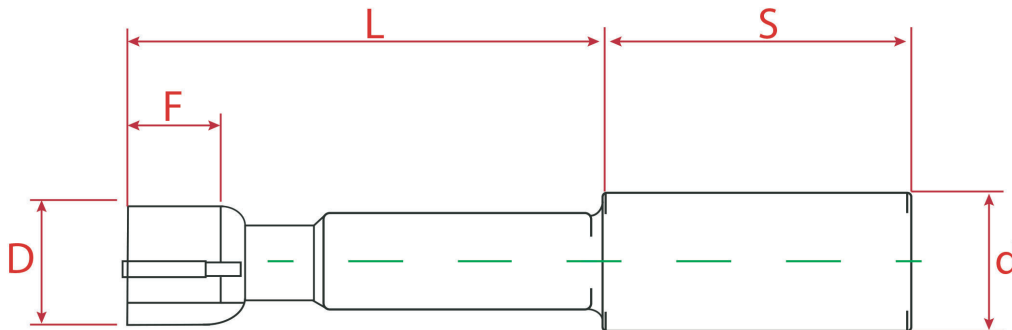
Brunswick reamers can be supplied with either micro grain carbide or cermet inserts and are supplied with through tool coolant as standard.

KEY FEATURES:

- Adjustable for wear compensation
- Pre-set to your tolerance
- Micro grain carbide or cermet tipped
- Blades marked for adjustment and measurement

KEY BENEFITS:

- Extended tool life and greater control of finished size
- No setting required
- Consistent bore size and finish



DIMENSION DATA

Diameter mm 'D'	Diameter imp 'D'	Standard working length mm 'L'	Long series working length mm 'L"	Shank diameter mm 'd'	Shank length mm 'S'	Flute length mm 'F'	Number of flutes
7.75 - 10.25	0.305" - 0.423"	70	110	10	45	7	4
10.26 - 11.75	0.403" - 0.462"	70	110	20	45	10	6
11.76 - 13.25	0.463" - 0.521"	70	110	20	45	10	6
13.26 - 18.25	0.522" - 0.718"	70	110	20	45	10	6
18.26 - 21.25	0.7182 - 0.836"	70	110	20	45	10	6
21.26 - 23.25	0.837" - 0.915"	70	110	20	45	10	6
23.26 - 26.75	0.915" - 1.053"	70	110	20	45	10	6
26.76 - 32.00	1.053" - 1.259"	70	110	20	45	16	6

AFP REAMERS

SIZE RANGE > 4.75 - 50.00MM

Size range availability 4.75mm to 50mm. Brunswick AFP reamer are designed for use in medium to high volume production environments where minimal tool change time is a factor.

The AFP reamer can be specified for cutting diameter, length of cut as well as shank diameter and overall length.

This enables you to integrate the AFP reamer into existing set-ups without any costly modifications to tool holding systems, machine settings or programming.

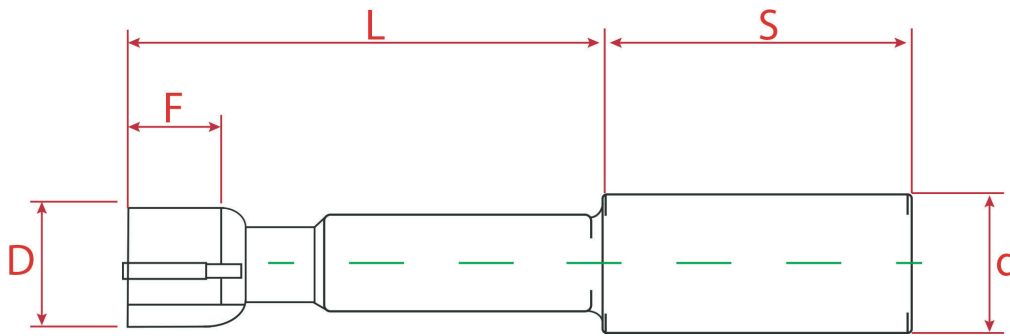
AFP Reamers can be supplied with either micro grain carbide or cermet inserts and are supplied with through tool coolant as standard.

KEY FEATURES:

- Precision ground to 5 microns tolerance
- Integral design
- Optimized tool length
- Plain cylindrical shank
- Non-adjustable
- Helix to suit application

KEY BENEFITS :

- Ideal for SPC applications
- Eliminates runout from tool to build up
- Increase in cutting data
- Utilizes existing collet chucks
- Tamper proof



DIMENSION DATA

Diameter mm 'D'	Diameter imp 'D'	Min. working length mm 'L'	Max. working length mm 'L'	RECOMMENDED SHANK DIAMETER						Number of flutes
				10mm	12mm	16mm	20mm	25mm	32mm	
4.75 - 12	0.187' - 0.472'	30	110	x	x	x				4
12 - 16	0.472' - 0.629'	30	110		x	x	x			6
16 - 18	0.629' - 0.708'	30	150		x	x	x			6
18 - 20	0.708' - 0.787'	30	150			x	x	x		6
20 - 25	0.787' - 0.984'	40	150			x	x	x		6
25 - 32	0.984' - 1.259'	50	150			x	x	x	x	8
32 - 50	0.1259' - 1.968'	50	170				x	x	x	8

KAISER COUPLING REPLACEMENT HEAD REAMERS ADJUSTABLE

SIZE RANGE > 30.0 - 150.00MM

The Brunswick reamer with the modular Kaiser coupling gives an accurate rigid connection ideal for reaming applications.

The reamer heads can be changed in a matter of seconds in the machine tool.

Reamer heads are available in either micro grain carbide or cermet.

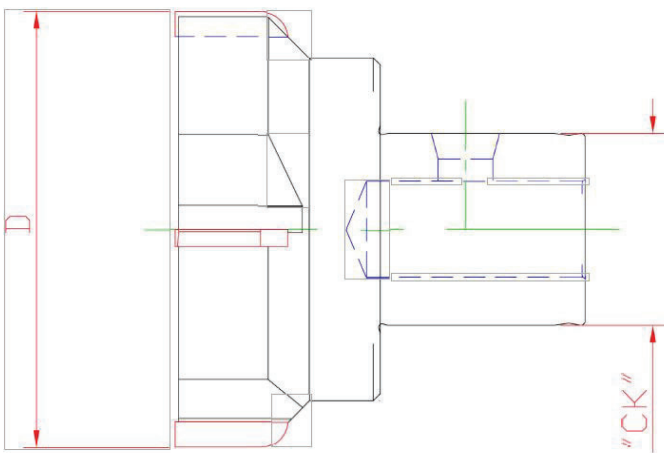
Two of the blades are identified for adjustment and measurement purposes.

KEY FEATURES:

- Adjustable
- Pre-set to your tolerance
- Micro grain carbide or cemet tipped
- Only 3 arbors to cover sizes
- Hex screw and pin mechanism to change heads
- Blades marked for adjustment and measurement

KEY BENEFITS:

- Extended tool life and greater control
- No setting required
- Consistent bore size and finish
- Reduced tool inventory
- Ease and speed to use, no special tools required



DIMENSION DATA

Diameter mm	Coupling size	Coupling allen key mm	Coupling screw torque setting mm	Number of flutes	Adjusting screw allen key mm
32.00 - 54.99	3	3	5	6	10
55.00 - 69.99	5	5	20	6	10
70.00 - 74.99	5	5	20	8	10
75.00 - 79.99	6	6	40	8	10
80.00 - 149.99	6	6	40	10	10

KAISER COUPLING REAMERS AFP

SIZE RANGE > 32.00 - 150.00MM

Size range availability is 32.00 to 150.00mm.

The Brunswick Reamer with the modular Kaiser Coupling gives an accurate rigid connection ideal for high speed Reaming which can give cutting data up to ten time faster than the conventional Carbide Reamers.

The Coupling allows full integration with all standard Kaiser boring equipment or specially designed Brunswick Reamer Arbors giving optimum working length and customer preferred machine fitting.

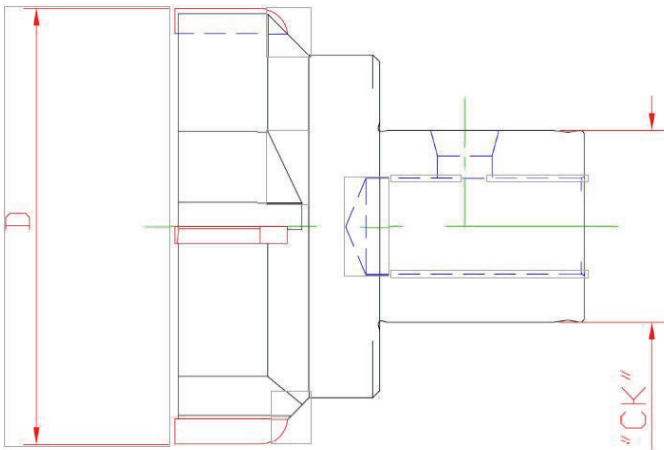
The Brunswick Reamer Heads can be changed in a matter in seconds in the machine tool, by use of an Allen Key in a simple lock system.

KEY FEATURES:

- Preset to your tolerance
- Micro grain carbide tipped
- Only 3 arbors to cover sizes
- Blades marked for adjustment and measurement
- Non-adjustable
- Helix to suit application

KEY BENEFITS:

- Higher cutting data reduced cycle time
- Consistent bore size and finish
- Reduced tool inventory
- Tamper proof



DIMENSION DATA

Diameter mm	Coupling size	Coupling allen key mm	Coupling screw torque setting mm	Number of flutes
32.00 - 54.99	3	3	5	6
55.00 - 69.99	5	5	20	6
70.00 - 74.99	5	5	20	8
75.00 - 79.99	6	6	40	8
80.00 - 149.99	6	6	40	10

PRE-REAMING CUTTERS

SIZE RANGE > 14.00 - 100.00MM

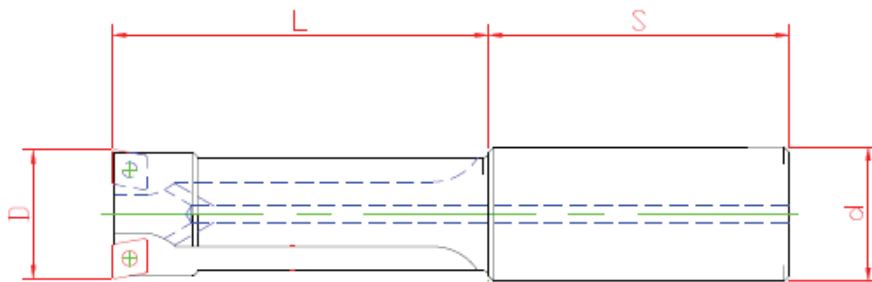
Size range availability is 14.00 to 100.00mm.

Brunswick, Pre-Ream Cutters are designed as high performance, indexable insert, core drills. They will consistently produce a bore of the correct size and geometric accuracy from either a cored hole or a rough pre-drilled hole prior to finishing with a Brunswick Reamer.

They can be used either on machining centres or lathe applications, with the added bonus on lathes the Pre-Reaming Cutter can also be used as a boring bar and a turning tool if turret positions are limited.

The Pre Reaming Cutter comes with through tool coolant as standard, and uses widely available ISO standard inserts. The standard shank is a parallel style with a flat of your choice, typically whistle or weldon.

For diameters below 14.00mm Brunswick Pre Reaming Cutters can be supplied with brazed carbide tips. Also non standard Pre Reaming Cutters can be designed to your requirements.



KEY FEATURES:

- Indexable insert
- Through tool coolant
- Dedicated diameter
- 90° approach angle
- Infinite choice of diameter within range

KEY BENEFITS:

- No regrinds required
- High production rates
- Better control of final reamed bore
- Better cutting action
- Optimum bore size for reaming

DIMENSION DATA

Diameter mm 'D'	Standard 'L' Dimensions mm	Long series 'L' Dimensions mm	Shank diameter 'd' mm	Shank length 'S' mm	Insert code	Insert screw	Key	Cartridge code
14.00 - 19.00	60	n/a	20	45	EPMW 040204	F2004T	T6	
19.01 - 28.00	70	Variable up to 4xD	25	45	CCMT 060204	5513 C20-03	T7	
28.01 - 50.00	70	Variable up to 4xD	32	55	CCMT 09T304	5513 020-01	T15	
50.01 - 69.99	70	Variable up to 4xD	40	65	TCMT 16T308	5513 020-01	T15	STFCR 12CA-16
70.00 - 100.00	70	Variable up to 4xD	50	85	TCMT 16T308	5513 020-01	T15	STFCR 12CA-16

FLOATING HOLDERS

The Brunswick Floating Reamer Holder is a self centring pre set unit which will eliminate most reaming problems associated with misalignment of the spindle to the pre reamed bore.

The holder will compensate for up to 0.3mm of machine error both axially and radially, which in turn improves both the quality and consistency of the reamed bores.

All Brunswick Reamer Floating Holders incorporate through tool coolant as standard, which should be utilised wherever possible.

KEY FEATURES

- Self centring
- Pre set
- Through tool coolant
- 0.3mm of float

KEY BENEFITS

- Better quality of bore
- Ease of use
- Tamper proof
- Increased tool life
- Consistent size achieved

FLOATING REAMER HOLDER SELECTION CHART

Holder Shank	Order code A	Front Adaptor	Order code B
25mm Parallel Shank	PFH25-	10mm Parallel Shank	10
32mm Parallel Shank	PFH32-	20mm Parallel Shank	20
40mm Parallel Shank	PFH40-	2 Morse Taper Bore	2MT
3 Morse Taper Shank	PFH3MT-	3 Morse Taper Bore	3MT
Varilock 50	PFH50V-	Brunswick replaceable Head Reamers (30-49.99mm dia) Standard series	2RHSTD
Varilock 63	PFH63V-	Brunswick replaceable Head Reamers (30-49.99mm dia) Long series	2RHLS
BT 40	PFHBT40-	Brunswick replaceable Head Reamers (50-100mm dia) Standard series	3RHSTD
Other shanks are available on request		Brunswick replaceable Head Reamers (50-100mm dia) Long series	3RHLS

Holders with Morse Taper Shanks not available with through tool coolant

To order the required Brunswick Floating Reamer Holder, select any item from order code 'A' and any item from order code 'B' for example PFH25-10

Floating Reamer Holders not specified above can be manufactured on short lead terms

Front End	10	20	2MTS	3MTS	R/Head 30-50 STD	R/Head 30-50 L/S	R/Head 50-100 STD	R/Head 50-100 L/S
Diameter 'D'	24	35	32	38	29	29	44	44
Length 'L'	28	28	90	110	45	100	45	100

Back End	25	32	40	3MTS	Varilock	40 INT
Length 'X'	68	68	68	68	90	90

'X' dimension on Taper Shanks are from the gauge line

CUTTING DATA

CONVENTIONAL REAMING CUTTING DATA		FEED PER REV MM				
Material	Cutting speed m/min	< 8mm diameter	8 - 14mm diameter	14 - 32mm diameter	32 - 50mm diameter	50mm + diameter
Steel	8 - 10	0.2 - 0.3	0.3 - 0.5	0.4 - 1.0	0.8 - 1.5	1.0 - 2.0
Grey Cast Iron	10 - 20	0.2 - 0.5	0.4 - 0.5	0.5 - 1.0	0.8 - 1.5	1.0 - 2.2
S G Iron	10 - 20	0.2 - 0.4	0.3 - 0.6	0.5 - 1.0	0.8 - 1.4	1.0 - 2.0
Stainless Steel	5 - 8	0.1 - 0.3	0.2 - 0.4	0.2 - 0.6	0.4 - 0.8	0.7 - 1.5
Copper	15 - 20	0.1 - 0.4	0.3 - 0.6	0.5 - 0.9	0.6 - 1.0	0.8 - 1.8
Aluminium	15 - 30	0.2 - 0.5	0.3 - 0.8	0.5 - 1.2	0.6 - 1.5	0.8 - 2.5
Titanium	6 - 12	0.1 - 0.3	0.2 - 0.4	0.2 - 0.6	0.4 - 0.8	0.7 - 1.5
Inconel	4 - 7	0.1 - 0.3	0.1 - 0.4	0.2 - 0.6	0.4 - 0.8	0.5 - 1.2
Reaming allowance on diameter mm		0.1 - 0.2	0.15 - 0.25	0.25 - 0.3	0.3 - 0.5	0.3 - 0.6

HIGH SPEED REAMING		FEED PER REV MM				
Material	Cutting speed m/min	< 8mm diameter	8 - 14mm diameter	14 - 32mm diameter	32 - 50mm diameter	50mm + diameter
Aluminium	300 - 400	0.3 - 0.6	0.5 - 1.3	0.8 - 1.4	1.0 - 1.8	1.0 - 2.2
Copper	100 - 200	0.2 - 0.5	0.5 - 1.4	0.8 - 1.6	1.0 - 2.0	1.0 - 3.0
Reaming allowance on diameter mm		0.1 - 0.2	0.15 - 0.25	0.15 - 0.3	0.2 - 0.4	0.2 - 0.5

In ideal cutting conditions Brunswick Carbide Reamers can be used at very high cutting data to produce excellent quality holes in the minimum of cycle time.

CUTTING DATA COATED

HIGH SPEED REAMING		FEED PER REV MM				
Material	Cutting speed m/mm	< 8mm diameter	8 - 14mm diameter	14 - 32mm diameter	32 - 50mm diameter	50mm + diameter
Steel	80 - 120	0.2 - 0.3	0.3 - 0.5	0.4 - 1.0	0.8 - 1.5	1.0 - 2.0
Grey Cast Iron	50 - 90	0.2 - 0.5	0.4 - 0.6	0.5 - 1.0	0.8 - 1.5	1.0 - 2.2
S G Iron	80 - 150	0.2 - 0.4	0.3 - 0.6	0.5 - 1.0	0.8 - 1.4	1.0 - 2.0
Stainless Steel	20 - 40	0.1 - 0.3	0.2 - 0.4	0.2 - 0.6	0.4 - 0.8	0.7 - 1.5
Copper	60 - 120	0.1 - 0.4	0.3 - 0.6	0.5 - 0.9	0.6 - 1.0	0.8 - 1.8
Aluminium	n/a	0.2 - 0.5	0.3 - 0.8	0.5 - 1.2	0.6 - 1.5	0.8 - 2.5
Titanium	n/a	0.1 - 0.3	0.2 - 0.4	0.2 - 0.6	0.4 - 0.8	0.7 - 1.5
Inconel	20 - 40	0.1 - 0.3	0.1 - 0.4	0.2 - 0.6	0.4 - 0.8	0.5 - 1.2
Reaming allowance on diameter mm		0.1 - 0.2	0.15 - 0.25	0.25 - 0.3	0.3 - 0.5	0.3 - 0.6

When using Brunswick Coated Reamers at the above cutting data the following criteria must be adhered to for achieving optimum results:

- The tool must be running true to within 0.010mm
- Through tool coolant must be used
- The correct reaming allowance left in the pre-reamed hole

If any of the above guidelines are not followed it may well be detrimental to tool life

CUTTING DATA CERMET

HIGH SPEED REAMING		FEED PER REV MM				
Material	Cutting speed m/mm	< 8mm diameter	8 - 14mm diameter	14 - 32mm diameter	32 - 50mm diameter	50mm + diameter
Steel	80 - 150	0.2 - 0.3	0.3 - 0.5	0.4 - 1.0	0.8 - 1.5	1.0 - 2.0
Grey Cast Iron	50 - 90	0.2 - 0.5	0.4 - 0.6	0.5 - 1.0	0.8 - 1.5	1.0 - 2.2
S G Iron	80 - 150	0.2 - 0.4	0.3 - 0.6	0.5 - 1.0	0.8 - 1.4	1.0 - 2.0
Stainless Steel	20 - 40	0.1 - 0.3	0.2 - 0.4	0.2 - 0.6	0.4 - 0.8	0.7 - 1.5
Copper	120 - 200	0.1 - 0.4	0.3 - 0.6	0.5 - 0.9	0.6 - 1.0	0.8 - 1.8
Aluminium	n/a	0.2 - 0.5	0.3 - 0.6	0.5 - 1.2	0.6 - 1.5	0.8 - 2.5
Titanium	n/a	0.1 - 0.3	0.2 - 0.4	0.2 - 0.6	0.4 - 0.8	0.7 - 1.5
Inconel	n/a	0.1 - 0.3	0.1 - 0.4	0.2 - 0.6	0.4 - 0.8	0.5 - 1.2
Reaming allowance on diameter mm		0.1 - 0.2	0.15 - 0.25	0.25 - 0.3	0.3 - 0.5	0.3 - 0.6

When using Brunswick Cermet Reamers at the above cutting data the following criteria must be adhered to for achieving optimum results:

- The tool must be running true to within 0.010mm
- Through tool coolant must be used
- The correct reaming allowance left in the pre-reamed hole

If any of the above guidelines are not followed it may well be detrimental to tool life

NON STANDARD REAMING & PRE REAMING PRODUCTS

If you have an application that cannot be reamed with one of our standard Brunswick Reamers, specials can easily be designed and manufacture to your requirements in short lead time, with the aid of our CAD system.

Special Reamers can take a multitude of forms, from the simplest change of working length or shank diameter of a Brunswick Adjustable Reamer, to more complicated designs such as:

GUIDED REAMERS

To overcome interrupted bores, use of Brunswick Reamers with a hardened chrome plated guide diameters immediately following the cutting edge will eliminate the tendency for the Reamer to 'wander'. Being ground a few microns below the lower limit of the finished bore, the guide does not come into contact unless the reamer moves from position, it then guides the Reamer back on line.

The guide can also be designed to precede the Reamer where the Reamer is of the non adjustable style.

These Reamers can also be manufactured to suit existing guide bushes, the guide diameter can be manufactured to be larger than the reamer diameter when the reamer needs to be run through a hardened steel bush. Allowances then need to be made for the length of bore.

MULTI DIAMETER REAMERS

These will eliminate costly machining time as several diameters can be reamed in one pass, in theory there is no limit to the number of diameters that can be on a single reamer. Certain limited restrictions however do apply to designing multi diameter Reamers, these will be discussed at the design stage with our Technical Sales Engineers.

SPECIAL PRE-REAMING CUTTERS

If you have an application where you feel that the addition of another diameter or chamfer detail could be beneficial, it may be possible to incorporate this into a Brunswick Pre-Reaming Cutter, reducing the number of tools in the machine and more importantly reducing the cycle time of the component.

Specials can easily be designed and manufactured to your requirements in short lead times, with the aid of our CAD system.

INDEXABLE INSERT SPECIAL TOOLING

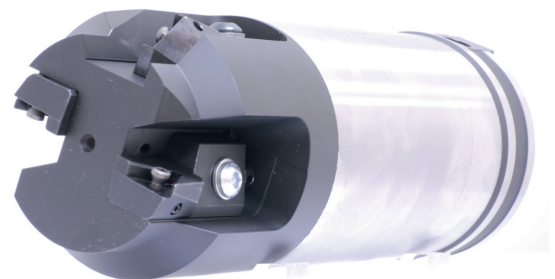
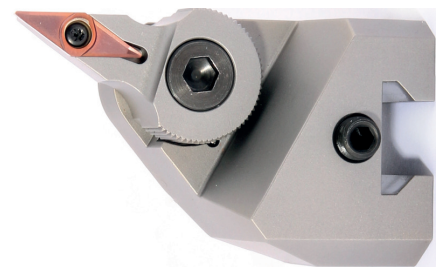
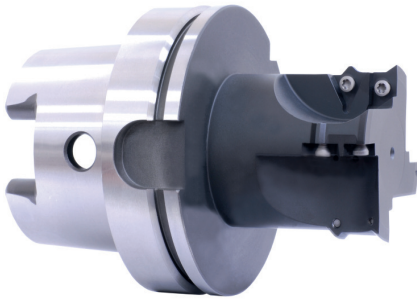
With many years of experience in designing and manufacturing special Indexable tooling, Brunswick Tooling has become a leader in the manufacture of tooling to match difficult and unique applications.

Our highly skilled staff provide high-quality special indexable insert cutting tools for all of your machining applications.

Utilizing the latest Design CAD/CAM software. We manufacture to your specifications, with you specifying the insert manufacturer's you require.

We are the experts in special length tool holders, adapters and made to order tooling. Manufacturing capability in BT, Din 69871, HSK, MTS, Polygon Shank etc.

Products are manufactured to customer's complete satisfaction.



BRAZED AND SOLID CARBIDE SPECIAL TOOLING

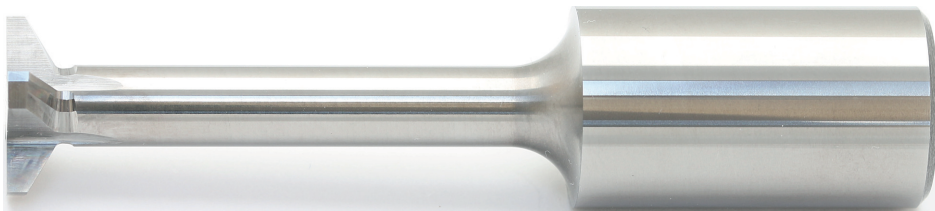
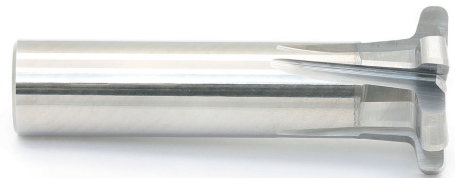
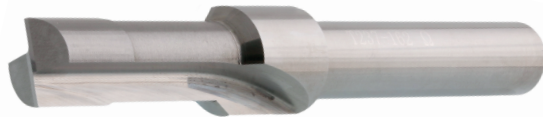
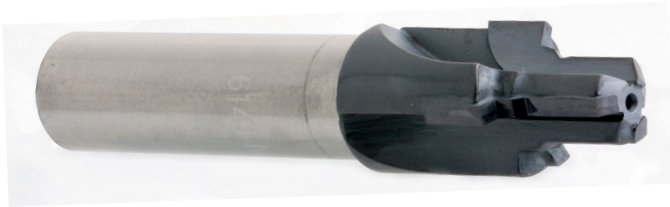
Whether your requirement is as simple as a single multi-step hole or complex with several tolerances and surface finish requirements, our flexibility allows us to custom create the right tooling products for your job, according to your specifications.

Our expertise encompasses Reamers, Milling cutters and Drills.

With investment in the latest Walter grinding technology, Brunswick Tooling can offer special performance tooling in brazed or solid carbide and PCD.

All precision manufactured and inspected to ISO 9001-2015.

We are able to offer full onsite refurbishment, regrinding and coating service for all your tooling.





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