



FOLIO TOOLING CATALOGUE

FOR CNC ROUTERS AND CUTTING TABLES

ISSUE 8



ROUTING
ENGRAVING
FOLDING
KNIFE BLADES

Company Profile

For over 30 years ITC have been manufacturing and supplying high quality round cutting tools to specifically meet the needs of our customers. No order is too big or small, we're happy to produce everything from 1000-piece jobs to individual orders.

Passionate about precision

ITC have consistently achieved success by investing in a team of capable, time-served and enthusiastic engineers and technical sales people, backed up by an in-house team which is second to none. From solid carbide and PCD tooling, through to indexable milling, turning and boring, plus top quality tool holders, ITC has an unbeatable product range.

- Our state-of-the-art production facility includes CNC grinding machines from the industry's leading manufacturers, including: Walter, Deckel, Rollomatic and Anca
- ITC's centralised oil filtration system ensures that grinding takes place under optimum conditions with clean oil. Our inspection department maintains these high standards by using computerised laser measuring equipment
- We source the best available products from around the world, and stock over 100,000 Solid Carbide and HSS-Co tools on the shelf ready for immediate dispatch, with a speedy modification service also available
- ITC can also provide same-day dispatch on standard stocked lines, whatever your industry sector may be

Technical jobs made simple

More companies than ever before, both in the UK and abroad, choose ITC to solve their manufacturing problems.

The reason for this? ITC's combination of a straightforward, first class service, rapid response, huge stocks and access to a diverse and ever-growing product line.

Our continued investment in cutting edge CNC grinding equipment gives us the capacity to rapidly manufacture custom made tools to your precise requirements, and to return used tools to an 'as new' condition.

A greater range

ITC's range of solid carbide routers, engravers and blades for the sign manufacturer are designed to give the best possible finish on the full range of materials used in today's high-tech sign industry.

Whether you are cutting foam, aluminium, acrylic, wood, brass or stainless steel, we can offer you the best possible selection of tooling for all your applications.

- **Standard engraving**
- **Solid carbide knife blades for cutting tables**
- **One-off specials or tool modification for more unusual jobs**
- **Comprehensive range of metric and imperial collets for your router spindle**
- **In-house manufacturing unit to re-sharpen your tooling and ensure maximum cost efficiency**
- **Full range of TCT woodworking tooling for next day delivery**

If you have any other queries or require further details, please don't hesitate to ask us.

itc-ltd.co.uk

You'll find all your router tooling needs at your fingertips on our website, with features that include:

- **Fast search facility**
- **Industry-specific sectors**
- **Online catalogue**
- **New products**
- **Special offers**
- **Technical help**



Expert support

We don't just supply specialist tools; we provide a highly specialised customer service.

Our staff are fully trained to provide expert technical advice and ongoing back-up on everything from specific tooling needs to general guidance on getting a project off the ground.

If you're not sure where to start we can even, upon request, arrange for one of our technical representatives to visit and assess your requirements.

Whatever your query, we're happy to offer immediate help, simply call:

Sally Hunt:

+44 (0) 1204 303435

+44 (0) 7971 542893

sally.hunt@itc-ltd.co.uk










































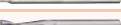



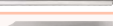
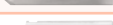







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NEW ITC APP

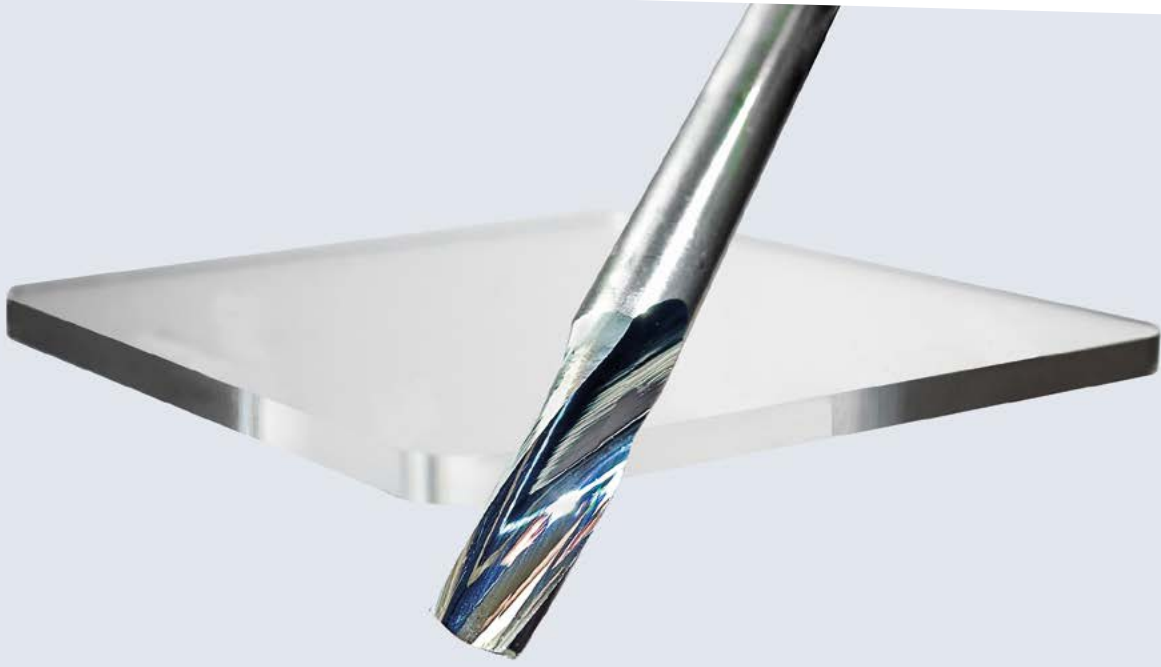
For more info visit:
www.itc-ltd.co.uk/itc-app



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Router Series Selection

Catalogue No.	MATERIAL						
	Acrylic/Foamex	ACM	Aluminium	Wood	Laminates	Brass	Steel
CLEARCUT / 8001							
8010							
8011							
8002							
8002-J							
8002-K							
8003							
8003-J							
8003-K							
8012							
8013							
8020							
8030							
8021							
8031							
8001-B							
8001-JB							
8002-B							
8002-JB							
8002-KB							
1001 (High-Speed)							
ENG							
ENG-BAL							
2011							
2571							
2552							
3551							
2591							
2621							
2662							
2631							
2632							
2121							
2122							
164-27ST							
3061							
4071							
3D							
4011							
2091							



ACRYLIC CUTTING AND FINISHING

Usually the aim when cutting Acrylic on a CNC Router is to have a minimal amount of subsequent operations to complete the project once the component has been machined. ITC's Clearcut Single Flute Router used under the correct machining conditions helps to eliminate additional sanding and polishing operations.

As always, the cutting tool is only one variable in achieving a great finish when cutting any material. Workpiece mounting issues, CNC machine rigidity, tool holding accuracy and collet condition all play vital parts in obtaining the best possible finish on your component's cut edges. All of these variables are especially relevant when cutting Acrylic.

Here below are a few simple steps to follow to achieve a great finish on your Acrylic:

- If your CNC machine has a tool changer utilise 2 tools to achieve the best possible finish. 1 tool for a roughing cut, 1 tool for a finishing cut. Once the finishing tool becomes slightly blunt it can be re-used as the roughing tool in future projects.
- Use the largest diameter possible Clearcut tool, a 6mm diameter tool is sufficient for most Acrylic thicknesses. Choose the shortest flute length possible to cover your material thickness. This will give you the most rigid tool setup possible.

Using the example of a 6mm diameter tool, cutting 6mm thick Acrylic Sheet, use the following machining strategy to cut out your component:

CUT 1 - TOOL 1 (Roughing Tool)

Spindle Speed 20,000 RPM. Feed Rate 2m/min (33mm/sec). Depth of Cut 5.8mm. Offset 0.4mm*.

CUT 2 - TOOL 2 (Finishing Tool)

Spindle Speed 20,000 RPM. Feed Rate 1m/min (17mm/sec). Depth of Cut to machine bed. Offset 0.0mm.

* This factor can vary depending on material type/brand etc. but is usually between 0.2 and 0.6mm. Experimental cuts with your own material type will establish the ideal Offset.

Tel: +44 (0) 1827 304500

Email: sales@itc-ltd.co.uk

8001 Series Clearcut

Single Flute Router



Description

Solid carbide single flute, upward spiral, 15° helix. Manufactured from Ultra Wear Resistant Micrograin Carbide, to extremely tight tolerances with a highly polished flute.

Application

Designed to give an exceptional finish on perspex and acrylic materials. In some cases eliminating the need for flame polishing components after cutting. This range of tool also offers exceptional surface finish on foamex and similar materials.

Metric Sizes (mm)

Catalogue No.	Size	Shank Diameter	Overall Length	Length of Cut
8001-2-F	2	6	50	7
8001-3-C	3	3	40	8
8001-3-D	3	3	40	12
8001-3-E	3	3	40	7
8001-3-F	3	6	50	11
8001-3-G	3	3	64	21
8001-4-C	4	4	40	11
8001-4-D	4	4	50	15
8001-4-E	4	4	50	7
8001-4-F	4	6	50	11
8001-4-G	4	4	80	31
8001-5-C	5	5	50	12
8001-5-D	5	5	58	21
8001-5-F	5	6	50	12
8001-6-C	6	6	58	21
8001-6-D	6	6	75	26
8001-6-E	6	6	58	14
8001-6-F	6	6	80	31
8001-8-C	8	8	75	26
8001-8-E	8	8	64	14
8001-10-C	10	10	75	26
8001-12-C	12	12	84	26



ACM MATERIAL MACHINING

At ITC we understand the constant pressure our customers are under to be price competitive, often involving using less expensive ACM (Aluminium Composite Material) sheet material. This can cause real issues for the customer, as they may find their usual tools aren't lasting as long as they have previously. Sometimes less expensive ACM sheets use recycled substrates in their composition which result in poor surface finish and reduced tool life.

ITC work continuously to evolve and improve our range of ACM tooling to address the issues facing our customers worldwide by working with ACM manufacturers and suppliers to establish which grades machine most satisfactorily.

This means that customers can make more informed choices when purchasing materials for jobs and also have their expectations more realistically managed.

This research has resulted in the extremely comprehensive range of router cutting and folding tools being offered to our customers, with new coatings and geometries for use on all grades of materials including virgin material ACM, recycled material ACM, fire retardant mineral core panels A2 and steel faced composite sheet.

All of these tools are available balanced for high speed frequency spindle and with stop rings for ATC systems.

* To further assist customers with extended tool life we offer a re-sharpening service involving chopping off the worn part of the tool, usually the bottom 3mm, and re-end cutting the tool enabling it to perform as new.

Tel: +44 (0) 1827 304500

Email: sales@itc-ltd.co.uk

8002 Series

Single Flute Router For Aluminium & ACM - Reinforced Shank



Description

Solid carbide single flute, upward spiral, 30° helix on reinforced 6mm shank, ideal for reducing number of collet changes, manufactured from Ultra Wear Resistant Micrograin Carbide.

Application

Offers exceptional surface finish on aluminium and ACM.

Metric Sizes (mm)

Catalogue No.	Size	Shank Diameter	Overall Length	Length of Cut
8002-2	2	6	50	7
8002-2.5	2.5	6	50	8
8002-3	3	6	50	10
8002-3.5	3.5	6	40	10
8002-3-1/4	3	1/4"	50	12
8002-4	4	6	50	10
8002-4X	4	6	64	22
8002-5	5	6	50	12
8002-5.5	5.5	6	50	14

8003 Series

Single Flute Stub Router For Aluminium & ACM

Application

Designed for use on both aluminium and ACM. The single flute design gives excellent swarf clearance.

Metric Sizes (mm)

Catalogue No.	Size	Shank Diameter	Overall Length	Length of Cut
8003-2	2	3	30	7
8003-3	3	3	30	8
8003-4	4	4	40	10
8003-6	6	6	50	14

8002 Series - Vitreo Coated

Single Flute Router For ACM - Reinforced Shank



Description

Solid carbide single flute, upward spiral, 30° helix on reinforced 6mm shank, ideal for reducing number of collet changes, manufactured from Ultra Wear Resistant Micrograin Carbide. Coated for extra life.

Application

Vitreo coated offers exceptional surface finish and tool life on ACM.

Metric Sizes (mm)

Catalogue No.	Size	Shank Diameter	Overall Length	Length of Cut
8002-2J	2	6	50	7
8002-3J	3	6	50	10
8002-4J	4	6	50	10

8002 Series - Iridis Coated

Single Flute Router For Aluminium - Reinforced Shank



Description

Solid carbide single flute, upward spiral, 30° helix on reinforced 6mm shank, ideal for reducing number of collet changes, manufactured from Ultra Wear Resistant Micrograin Carbide. Coated for extra life.

Application

Iridis coated offers exceptional surface finish and tool life on aluminium.

Metric Sizes (mm)

Catalogue No.	Size	Shank Diameter	Overall Length	Length of Cut
8002-2K	2	6	50	7
8002-3K	3	6	50	10
8002-4K	4	6	50	10

8003 Series - Vitreo Coated

Single Flute Stub Router For ACM



Description

Solid carbide single flute, upward spiral, 30° helix. Manufactured from Ultra Wear Resistant Micrograin Carbide to extremely tight tolerances, with exceptional surface finish. Short overall length combined with useful longer cut length, offer a very robust cutter for most applications.

Application

Vitreo coated offers exceptional surface finish and tool life on ACM.

Metric Sizes (mm)

Catalogue No.	Size	Shank Diameter	Overall Length	Length of Cut
8003-2J	2	3	30	7
8003-3J	3	3	30	8
8003-4J	4	4	40	10
8003-6J	6	6	50	14

8003 Series - Iridis Coated

Single Flute Router For Aluminium

Application

Iridis coated offers exceptional surface finish and tool life on aluminium.

Metric Sizes (mm)

Catalogue No.	Size	Shank Diameter	Overall Length	Length of Cut
8003-2K	2	3	30	7
8003-3K	3	3	30	8
8003-4K	4	4	40	10
8003-6K	6	6	50	14

Di-Bond Folding Tool



Description

Solid carbide 2 flute, 1/2" head diameter, with a 90° or 135° inclusive angle and a 3mm flat.

Application

The Di-Bond folding tools enable precise folding of Di-Bond and similar aluminium composite materials typically up to 5mm thick. The following are the most commonly requested types. We can also manufacture to your own specification - for example - alternative angles, varying flats, shanks etc to suit your router. Not suitable for high frequency spindles (see p. 50)

Sizes

Catalogue No.	Size	Shank Diameter	Inclusive Angle	Width of Flat	Overall Length
2021-90-6	1/2"	6mm	90°	3mm	2-1/2"
2021-135-6	1/2"	6mm	135°	3mm	2-1/2"
2021-90	1/2"	1/4"	90°	3mm	2-1/2"

Di-Bond Folding Tool - Helical Flute



Application

As above, but tool is helical flute with a more rigid body for improved cuttings speeds.

Sizes

Catalogue No.	Size	Shank Diameter	Inclusive Angle	Width of Flat	Overall Length
2421-90-6	10	6	90°	3	76



ITC RESEARCH, DEVELOPMENT AND TESTING

To demonstrate our continuing commitment to customer service and product development, ITC have installed an XYZ CNC routing machine.

The machine has been installed to both enhance existing tools and develop new tools. It provides the machine capacity and time to trial, enhance and develop existing product lines, whilst offering an internal testbed for all future product developments, with the facility to put the next generation of cutting tool substrates, coatings and geometries to the test.

For customers witnessing issues with particular materials and jobs, we can take a sample of the material and do in-house testing without disrupting their production. Having this facility avoids inconvenient customer downtime and gives us the opportunity to apply a variety of cutting tools and machining parameters to achieve the best possible result. We have already improved cycle times, tool life and surface finishes for end-users by having the time to offer in-depth investigation and analysis.

We invite any of our customers to contact us to discuss issues they may have with their current machining methods and tooling and to send us samples of their material for testing.

Tel: +44 (0) 1827 304500

Email: sales@itc-ltd.co.uk

8010 Series

Single Flute Router



Description

Solid carbide single flute, upward spiral, 45° helix. Manufactured from Ultra Wear Resistant Micrograin Carbide to extremely tight tolerances, with exceptional surface finish.

Application

Designed for use on aluminium, acrylics and other soft non-ferrous materials. The single flute design gives excellent swarf clearance, combined with a short cutting length for strength.

Metric Sizes (mm)

Catalogue No.	Size	Shank Diameter	Overall Length	Length of Cut
8010-1	1	3	40	3
8010-1.5	1.5	3	40	4
8003-2	2	3	30	7
8010-2.5	2.5	3	40	7
8010-3	3	3	40	8
8010-4	4	4	50	11
8010-5	5	5	50	13
8010-6	6	6	57	13
8010-8	8	8	63	19
8010-10	10	10	72	22
8010-12	12	12	83	26

Tech Tip

Single flute spiral routers allow the fastest possible cutting speeds.

8011 Series

Single Flute Stub Router



Description

Solid carbide single flute, upward spiral, 45° helix, stub length, manufactured from Ultra Wear Resistant Micrograin Carbide.

Application

Offers exceptional surface finish on aluminium, acrylic and PVC. Stub length gives increased rigidity.

Metric Sizes (mm)

Catalogue No.	Size	Shank Diameter	Overall Length	Length of Cut
8011-3	3	3	40	5
8011-4	4	4	50	6
8011-5	5	5	50	7
8011-6	6	6	50	8

8012 Series

Long Series Single Flute Router



Description

Solid carbide single flute, upward spiral, 30° helix. Manufactured from Ultra Wear Resistant Micrograin Carbide, to extremely tight tolerances with exceptional surface finish.

Application

Offers exceptional surface finish on aluminium, acrylic and PVC.

Metric Sizes (mm)

Catalogue No.	Size	Shank Diameter	Overall Length	Length of Cut
8012-2	2	3	38	10
8012-3	3	3	38	10
8012-4	4	4	50	14
8012-5	5	5	60	16
8012-6	6	6	60	20
8012-8	8	8	75	25
8012-10	10	10	100	40
8012-12	12	12	100	50

Imperial Size (inches)

Catalogue No.	Size	Shank Diameter	Overall Length	Length of Cut
8012-1/4	1/4	1/4	2-1/2	3/4

Extra Long Series Single Flute Router For Aluminium & Plastics - Metric Sizes (mm)

Catalogue No.	Size	Shank Diameter	Overall Length	Length of Cut
8012-3X	3	3	55	12
8012-4X	4	4	64	20
8002-4X	4	6	64	22
8012-6X	6	6	75	26
8012-6XX	6	6	75	31
8012-8X	8	8	100	31

8013 Series

Downward Spiral Single Flute Router



Description

Solid carbide single flute, downward spiral, 30° helix. Manufactured from Ultra Wear Resistant Micrograin Carbide, to extremely tight tolerances with exceptional surface finish.

Application

Designed for use on aluminium, acrylic and other non-ferrous materials. The downward spiral helps to hold the material down whilst cutting. Particularly suitable for thinner sheet.

Metric Sizes (mm)

Catalogue No.	Size	Shank Diameter	Overall Length	Length of Cut
8013-1	1	3	40	4
8013-2	2	3	40	11
8013-3	3	3	40	11
8013-4	4	4	50	14
8013-6	6	6	58	14
8013-8	8	8	80	26
8013-10	10	10	80	31

Tech Tip

If coolant cannot be used a small amount of compressed air will resolve melting issues and improve surface finish.

8020 / 8030 Series - Straight Flute

2 Flute Straight Router



3 Flute Straight Router



Description

Solid carbide, single end, standard length, straight shank, straight flute, right hand cut, plunge style end cut.

Application

The straight flute router is an excellent tool for routing harder materials and also where a fine finish is required. The 3 flute design offers more strength than the 2 flute router. The 2 flute provides maximum swarf clearance.

Metric Sizes (mm)

Catalogue No. [2 Flute]	Catalogue No. [3 Flute]	Size	Shank Diameter	Overall Length	Length of Cut
8020-3	8030-3	3	3	40	12
8020-4	8030-4	4	4	50	16
8020-5	8030-5	5	5	50	18
8020-6	8030-6	6	6	58	20
8020-8	8030-8	8	8	64	22
8020-10	8030-10	10	10	70	25

2 Flute Straight Router

Application

Suitable for materials up to 55mm thick, especially foam.

Metric Sizes (mm)

Catalogue No.	Size	Shank Diameter	Overall Length	Length of Cut
8020-6X	6	6	100	55
8020-8X	8	8	100	55
8020-10X	10	10	100	55

8021 / 8031 Series - Downward Spiral

2 Flute Spiral Router



3 Flute Spiral Router



Description

2 flute, solid carbide, single end, standard length, straight shank, downward spiral, 30° helix, right hand cut, plunge style end cut.

Application

The 2 flute left hand helix down cut router is an excellent tool for cutting materials that are flexible. The left hand helix directs the cutting force downwards holding the material rigid against the bottom template or support. Burrs on the top surface of the work piece are eliminated. Typically used on softer materials.

The 3 flute left hand helix down cut router is best suited for applications requiring good finishes. This router is the best selection for free hand routing where smooth chatterless operation is required.

Metric Sizes (mm)

Catalogue No. (2 Flute)	Catalogue No. (3 Flute)	Size	Shank Diameter	Overall Length	Length of Cut
8021-3	8031-3	3	3	40	12
8021-4	8031-4	4	4	50	16
8021-5	8031-5	5	5	50	18
8021-6	8031-6	6	6	58	20
8021-8	8031-8	8	8	64	25
8021-10	8031-10	10	10	70	25
8021-12	8031-12	12	12	76	30

Tech Tip

Decrease your normal feed rate with downward spiral tools.

2571 Series

2 Flute Router



Description

2 flute, solid carbide, upward spiral, 30° helix.

Application

A general purpose router. The two flute construction is a multi-purpose tool that can successfully be used to plunge cut. It is an economical tool for routing wood, non-ferrous metals, and plastics.

Metric Sizes (mm)

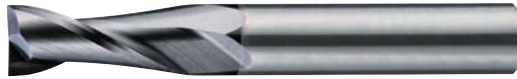
Catalogue No.	Size	Shank Diameter	Overall Length	Length of Cut
2571-2	2	3	38	7
2571-3	3	3	38	9
2571-4	4	4	51	14
2571-5	5	5	51	16
2571-6	6	6	64	19
2571-8	8	8	64	21

Tech Tip

Look after your tools. Always replace them in their protective packet when not in use.

2011 Series

2 Flute Coated Router - AlTiN Coated



Description

2 flute solid carbide, upward spiral, 30° helix. Manufactured from Ultra Wear Resistant Micrograin Carbide, AlTiN coated.

Application

Designed for applications requiring extra tool life, particularly suitable for cutting engraving laminates and fire retardant MDF.

Metric Sizes (mm)

Catalogue No.	Size	Shank Diameter	Overall Length	Length of Cut
2011-1.0C	1	3	38	3
2011-1.5C	1.5	3	38	5
2011-2.0C	2	3	38	7
2011-2.5C	2.5	3	38	7
2011-3.0C	3	3	38	9
2011-3.0C-6	3	6	50	11
2011-3.5C	3.5	4	51	12
2011-4.0C	4	4	51	14
2011-4.0C-6	4	6	50	14
2011-4.5C	4.5	5	51	14
2011-5.0C	5	5	51	16
2011-6.0C	6	6	64	19
2011-6.0C-L	6	6	64	26
2011-7.0C	7	8	64	19
2011-8.0C	8	8	64	21
2011-10.0C	10	10	70	22
2011-12.0C	12	12	76	25

Tech Tip

Clean collets and locknuts during every tool change.

2591 Series

2 Flute Router - TiN Coated



Description

2 flute, Ultra Fine Grain solid carbide, upward spiral, 30° helix, titanium nitride coated.

Application

The 2591 series 2 flute router is a good choice where extra tool life is required.

Metric Sizes (mm)

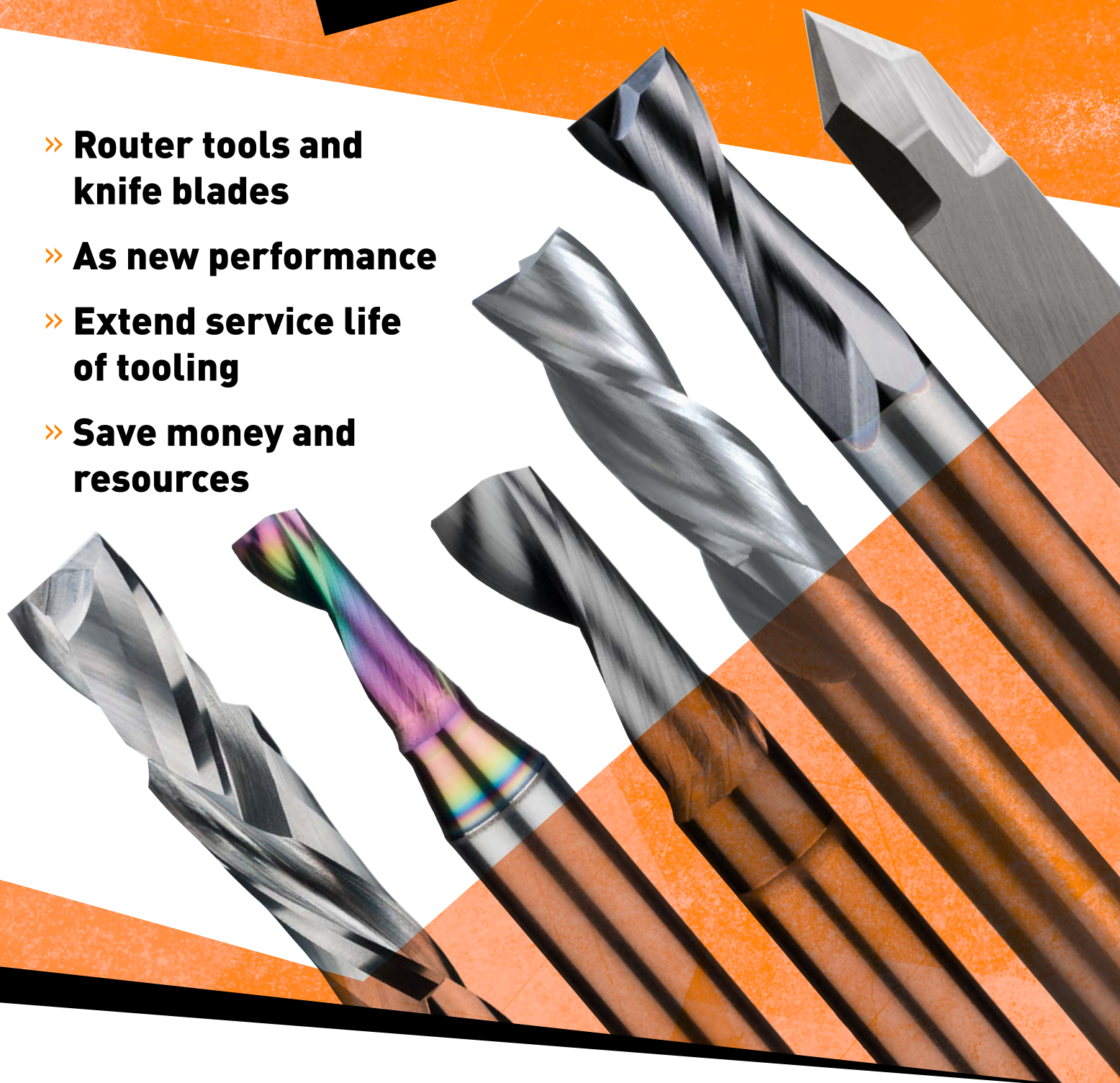
Catalogue No.	Size	Shank Diameter	Overall Length	Length of Cut
2591-2	2	3	38	7
2591-3	3	3	38	9
2591-4	4	4	51	14
2591-6	6	6	64	19

Tech Tip

Look after your tools. Always replace them in their protective packet when not in use.

REGRIND

- » Router tools and knife blades
- » As new performance
- » Extend service life of tooling
- » Save money and resources



2621 Series

2 Flute Router - Long Series



Description

2 flute, solid carbide, long length, straight shank, upward spiral, 30° helix, right hand cut, centre cutting.

Application

Suitable for applications where a standard 2 flute tool does not offer sufficient reach. Most commonly used on soft non-ferrous materials.

Metric Sizes (mm)

Catalogue No.	Size	Shank Diameter	Overall Length	Length of Cut
2621-3	3	3	64	19
2621-4	4	4	64	19
2621-5	5	5	64	20
2621-6	6	6	75	28
2621-8	8	8	75	28
2621-10	10	10	89	32
2621-12	12	12	100	45
2621-16	16	16	110	56

Tech Tip

Tools can often be cleaned of resin build up by soaking them in 'full fat' cola drink.

2631 Series

2 Flute Router - Extra Long Series



Description

2 flute, solid carbide, extra long length, square end, straight shank, upward spiral, 30° helix, right hand cut, centre cutting.

Application

Suitable for applications where extra long reach is required. Most commonly used on soft non-ferrous materials.

Metric Sizes (mm)

Catalogue No.	Size	Shank Diameter	Overall Length	Length of Cut
2631-3	3	3	75	25
2631-4	4	4	75	28
2631-5	5	5	100	31
2631-6	6	6	100	38
2631-6-XLS	6	6	80	45
2631-8	8	8	100	41
2631-8-XLS	8	8	100	55
2631-10	10	10	100	45
2631-10-XLS	10	10	110	55
2631-12	12	12	150	75
2631-16	16	16	150	75

Tech Tip

ITC can manufacture special styles of tools not shown in this brochure – often in only a few days.

2121 Series

XXLS 2 Flute Router



Description

2 flute solid carbide, straight shank, upward spiral, 30° helix, manufactured from Ultra Wear Resistant Micrograin Carbide, square end.

Application

Designed for applications requiring extremely long reach in a variety of materials.

Metric Sizes (mm)

Catalogue No.	Size	Shank Diameter	Overall Length	Length of Cut
2121-6	6	6	150	38
2121-8	8	8	150	40
2121-10	10	10	200	50
2121-12	12	12	200	75
2121-16	16	16	200	75
2121-20	20	20	200	75

Tech Tip

When using long and XXL length routers of smaller diameters always use a shorter tool first to avoid or reduce vibration and improve surface finish.

2091 Series

Upcut / Downcut Router



Description

Solid carbide compression router, manufactured from Ultra Wear Resistant Micrograin Carbide. Lower part of the flute is Right Hand Spiral / Right Hand Cut, upper part of flute Left Hand Spiral / Right Hand Cut. Cupro coated for superior tool life.

Application

Specifically designed for the efficient machining of MDF, wood laminates and other similarly abrasive materials. The reverse helix flute design has the effect of pulling the top and bottom of the work piece in towards the centre, eliminating de-lamination.

2 Flute / Metric Sizes (mm)

Catalogue No.	Size	Shank Diameter	Overall Length	Length of Cut	Crossover Length
2091-3F	3	6	58	10	3
2091-6F	6	6	75	22	6
2091-6FC	6	6	58	19	3
2091-8F	8	8	80	26	6
2091-10F	10	10	80	22	6
2091-10FX	10	10	80	27	6
2091-12F	12	12	80	28	8
2091-12JX	12	12	100	55	8

3 Flute / Metric Sizes (mm)

Catalogue No.	Size	Shank Diameter	Overall Length	Length of Cut	Crossover Length
2093-10A	10	10	80	22	6

Tech Tip

ITC can manufacture special styles of tools not shown in this brochure - often in only a few days.

2552 Series

2 Flute Ball Nose Router



Description

2 flute solid carbide, single end, standard length, ball nose, straight shank, upward spiral, 30° helix, centre cutting.

Application

Similar to square end, but with the added advantage of suitability to rout contoured surfaces.

Metric Sizes (mm)

Catalogue No.	Size	Shank Diameter	Overall Length	Length of Cut
2552-1	1	3	38	2
2552-1.5	1.5	3	38	3
2552-2	2	3	38	7
2552-2.5	2.5	3	38	7
2552-3	3	3	38	9
2552-4	4	4	51	14
2552-5	5	5	51	16
2552-6	6	6	64	19
2552-8	8	8	64	21

2662 Series

2 Flute Ball Nose Router - Long Series



Description

2 flute, solid carbide, long length, ball nose, straight shank, upward spiral, 30° helix, right hand cut, centre cutting.

Application

Suitable for use in applications where a standard 2 flute ball nose does not offer sufficient reach.

Metric Sizes (mm)

Catalogue No.	Size	Shank Diameter	Overall Length	Length of Cut
2662-3	3	3	55	19
2662-4	4	4	64	19
2662-5	5	5	64	20
2662-6	6	6	75	28
2662-8	8	8	75	28
2662-10	10	10	89	32
2662-12	12	12	100	45

Tech Tip

Ask ITC about re-grinding your tools - it is often economical.

2632 Series

2 Flute Ball Nose Router - Extra Long Series



Description

2 flute, solid carbide, extra long length, ball nose, straight shank, upward spiral, 30° helix, right hand cut, centre cutting.

Application

Suitable for use in applications where extra long reach is required.

Metric Sizes (mm)

Catalogue No.	Size	Shank Diameter	Overall Length	Length of Cut
2632-3	3	3	75	25
2632-4	4	4	75	31
2632-5	5	5	100	31
2632-6	6	6	100	38
2632-8	8	8	100	41
2632-10	10	10	100	45
2632-12	12	12	150	75
2632-16	16	16	150	75

Tech Tip

If you require something you cannot find in this catalogue please call ITC Sales.

2122 Series

XXLS 2 Flute Ball Nose Router



Description

2 flute solid carbide, ball nose, extra long length, straight shank, upward spiral, 30° helix, manufactured from Ultra Wear Resistant Micrograin Carbide.

Application

Designed for applications requiring extremely long reach in a variety of materials.

Metric Sizes (mm)

Catalogue No.	Size	Shank Diameter	Overall Length	Length of Cut
2122-6	6	6	150	38
2122-8	8	8	150	40
2122-10	10	10	200	50
2122-12	12	12	200	75
2122-16	16	16	200	75
2122-20	20	20	200	75

These tools can be modified to your requirements within our CNC manufacturing facility.
Alternatively we can make complete to your specifications.

Tech Tip

If you require help or advice on your choice of tool please do not hesitate to call us.

3551 Series

3 Flute Router



Description

3 flute, solid carbide, upward spiral, 30° helix.

Application

A general purpose router, particularly suitable for brass and copper.

Metric Sizes (mm)

Catalogue No.	Size	Shank Diameter	Overall Length	Length of Cut
3551-3	3	3	38	9
3551-4	4	4	51	14
3551-5	5	5	51	16
3551-6	6	6	64	19
3551-8	8	8	64	21

3061 Series

3 Flute Router For Stainless Steel



Description

3 Flute Solid Carbide, upward spiral with corner chamfer for extra strength, 30° helix. Manufactured from Ultra Micrograin Carbide, TiAlN coated to give extra wear resistance.

Application

Designed for use on stainless & other steels commonly used in the sign making industry. The special substrate, combined with the hard and lubricious surface coating, gives unbeatable performance.

Metric Sizes (mm)

Catalogue No.	Size	Shank Diameter	Overall Length	Length of Cut	Chamfer
3061-3C	3	6	58	3	0.5
3061-4C	4	6	58	4	0.5
3061-6C	6	6	58	6	0.5

General Instructions For Routing Stainless Steel

Run Machine @ 4000 RPM

Feed @ 2-3 mm/sec

Plunge @ 1/2 of feed rate

- Ensure the cutter is all the way through the material before you start traversing.
- Use a sacrificial bed of foamex.
- Glue your stainless steel workpiece to the foamex, you will then remove the foamex when the job is complete.
(Spray carpet glue is ideal)
- It is imperative that your material is rigid and firmly stuck down.
- Use plenty of coolant.

Any questions, please do not hesitate to contact us on the number below, alternatively ring Sally on + 44 (0) 1204 303435.

164-27 Series

2 Flute Miniature Router



Description

2 flute, solid carbide, standard length, square end, 30° helix, upward spiral.

Application

Designed for precision machining in applications where a particularly small tool is required. The common shank size provides rigidity and the flute design gives sufficient swarf clearance for slotting applications.

Metric Sizes (mm)

Catalogue No.	Size	Shank Diameter	Overall Length	Length of Cut
164-0002-27	0.2	3	38	0.6
164-0003-27	0.3	3	38	0.9
164-0004-27	0.4	3	38	1.2
164-0005-27	0.5	3	38	1.5
164-0006-27	0.6	3	38	1.8
164-0007-27	0.7	3	38	2.1
164-0008-27	0.8	3	38	2.4
164-0009-27	0.9	3	38	2.7
164-0010-27	1.0	3	38	3.0
164-0011-27	1.1	3	38	3.3
164-0012-27	1.2	3	38	3.6
164-0013-27	1.3	3	38	3.9
164-0014-27	1.4	3	38	4.2
164-0015-27	1.5	3	38	4.5
164-0016-27	1.6	3	38	4.8
164-0017-27	1.7	3	38	5.1
164-0018-27	1.8	3	38	5.4
164-0019-27	1.9	3	38	5.7
164-0020-27	2.0	3	38	6.0

Tech Tip

ITC can manufacture special styles of tools not shown in this brochure - often in only a few days.

164-27ST Series

2 Flute Miniature Stub Router



Description

2 flute, solid carbide, stub length, square end, 30° helix, upward spiral.

Application

Suitable for applications where the standard length tool may lack rigidity. Flute length is typically half that of the standard tool.

Metric Sizes (mm)

Catalogue No.	Size	Shank Diameter	Overall Length	Length of Cut
164-0002-27ST	0.2	3	38	0.4
164-0003-27ST	0.3	3	38	0.6
164-0004-27ST	0.4	3	38	0.8
164-0005-27ST	0.5	3	38	1.0
164-0006-27ST	0.6	3	38	1.2
164-0007-27ST	0.7	3	38	1.4
164-0008-27ST	0.8	3	38	1.6
164-0009-27ST	0.9	3	38	1.8
164-0010-27ST	1.0	3	38	2.0
164-0011-27ST	1.1	3	38	2.2
164-0012-27ST	1.2	3	38	2.4
164-0013-27ST	1.3	3	38	2.6
164-0014-27ST	1.4	3	38	2.8
164-0015-27ST	1.5	3	38	3.0
164-0016-27ST	1.6	3	38	3.2
164-0017-27ST	1.7	3	38	3.4
164-0018-27ST	1.8	3	38	3.6
164-0019-27ST	1.9	3	38	3.8
164-0020-27ST	2.0	3	38	4.0

Tech Tip

Replace collets regularly. They are a consumable item and will wear with use.

4071 Series

Chamfer Tool



Description

4 flute solid carbide chamfering tool, 120, 100, 90 and 60 degree inclusive angle with staggered teeth. Manufactured from Ultra Tough Micrograin Carbide. Available uncoated or Cupro coated.

Application

This tool can be used to chamfer and countersink a variety of materials. The staggered tooth design leads to smoother cutting and better surface finish.

Metric Sizes (mm)

Catalogue No.	Catalogue No. Coated	Size	Shank Diameter	Overall Length	Inclusive Angle
4071-3-60	4071-3F-60	3	3	50	60°
4071-3-90	4071-3F-90	3	3	50	90°
4071-4-60	4071-4F-60	4	4	50	60°
4071-4-90	4071-4F-90	4	4	50	90°
4071-4-100	4071-4F-100	4	4	50	100°
4071-4-120	4071-4F-120	4	4	50	120°
4071-5-60	4071-5F-60	5	5	50	60°
4071-5-90	4071-5F-90	5	5	50	90°
4071-5-100	4071-5F-100	5	5	50	100°
4071-5-120	4071-5F-120	5	5	50	120°
4071-6-60	4071-6F-60	6	6	64	60°
4071-6-90	4071-6F-90	6	6	64	90°
4071-6-100	4071-6F-100	6	6	64	100°
4071-6-120	4071-6F-120	6	6	64	120°
4071-8-60	4071-8F-60	8	8	64	60°
4071-8-90	4071-8F-90	8	8	64	90°
4071-8-100	4071-8F-100	8	8	64	100°
4071-8-120	4071-8F-120	8	8	64	120°
4071-10-60	4071-10F-60	10	10	70	60°
4071-10-90	4071-10F-90	10	10	70	90°
4071-10-100	4071-10F-100	10	10	70	100°
4071-10-120	4071-10F-120	10	10	70	120°
4071-12-60	4071-12F-60	12	12	76	60°
4071-12-90	4071-12F-90	12	12	76	90°
4071-12-100	4071-12F-100	12	12	76	100°
4071-12-120	4071-12F-120	12	12	76	120°

4011 Series

Corner Rounding Cutter



Description

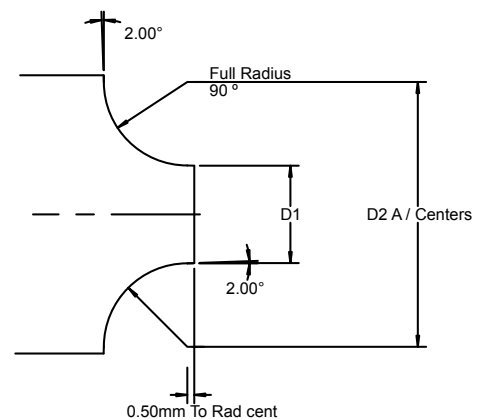
4 flute solid carbide tool with internal radius, manufactured from Ultra Wear Resistant Micrograin Carbide. Includes full 90° radius plus runout. Available uncoated or Cupro coated.

Application

Designed to produce an external radius on a variety of materials.

Metric Sizes (mm)

Catalogue No.	Catalogue No. Coated	Shank Diameter	Overall Length	D1	D2	Corner Radius
4011-8-0.5R	4011-8F-0.5R	8	64	6.00	7.035	0.5
4011-8-1.0R	4011-8F-1.0R	8	64	5.00	7.035	1.0
4011-10-1.5R	4011-10F-1.5R	10	70	6.00	9.035	1.5
4011-10-2.0R	4011-10F-2.0R	10	70	5.00	9.035	2.0
4011-12-2.5R	4011-12F-2.5R	12	76	6.00	11.035	2.5
4011-12-3.0R	4011-12F-3.0R	12	76	5.00	11.035	3.0
4011-16-3.5R	4011-16F-3.5R	16	89	8.00	15.035	3.5
4011-16-4.0R	4011-16F-4.0R	16	89	7.00	15.035	4.0
4011-16-4.5R	4011-16F-4.5R	16	89	6.00	15.035	4.5
4011-16-5.0R	4011-16F-5.0R	16	89	5.00	15.035	5.0
4011-20-5.5R	4011-20F-5.5R	20	100	8.00	19.035	5.5
4011-20-6.0R	4011-20F-6.0R	20	100	7.00	19.035	6.0



D Series Tools for Superior Engraving

One Dimensional Engraving Tools



Description

The D series is solid carbide and available in three different angles; 30°, 60° and 90° inclusive. Other sizes are available on request.

Application

Designed to give superior performance when engraving a variety of materials from plastics to steels. This range is for bottom loading engraving and routing machines.

One Dimensional

Catalogue No.	Included Angle	Diameter	Overall Length	Split Length
ENG-3.0-30	30°	3	38	5
ENG-6.0-30	30°	6	57	8
ENG-3.0-60	60°	3	38	5
ENG-6.0-60	60°	6	57	8
ENG-3.0-90	90°	3	38	5
ENG-6.0-90	90°	6	57	8

Engraving Tools With Flats

Catalogue No.	Included Angle	Flat	Diameter	Overall Length	Split Length
ENG-6.0-60-0.25	60°	0.25	6	56	8
ENG-6.0-60-0.50	60°	0.50	6	56	8
ENG-6.0-60-0.75	60°	0.75	6	56	8
ENG-6.0-60-1.0	60°	1.0	6	56	8
ENG-6.0-60-1.25	60°	1.25	6	56	8
ENG-6.0-60-1.5	60°	1.5	6	56	8
ENG-6.0-60-2.0	60°	2.0	6	56	8

Engraving Tools For Top Loading Machines

Catalogue No.	Diameter	Overall Length	Split Length
ENG-1719-00	11/64"	6-1/2"	1/2"
ENG-2500-00	1/4"	6-1/2"	1/2"

3 Dimensional Engraving Tools



Description

The 3D engraving/carving tool is a 2 flute design with brazed carbide inserts, available in various angles from 90° to 150° inclusive.

Application

Typically used with prismatic software for 3D engraving and carving, also suitable for chamfering a variety of materials. Not suitable for high frequency spindles.

Metric Sizes (mm)

Catalogue No.	Included Angle	Diameter	Overall Length	Shank Diameter
150-3D-8	150°	32	50	8
120-3D-8	120°	32	50	8
110-3D-8	110°	32	50	8
90-3D-8	90°	32	50	8

Imperial Sizes (inches)

Catalogue No.	Included Angle	Diameter	Overall Length	Shank Diameter
120-3D	120°	1.25	2	1/4
90-3D	90°	1.25	2	1/4

190 Series

Diamond Cut Router for Glass Fibre



Description

Multiple flute, solid carbide, diamond cut, right hand cut, plunging end cut.

Application

Designed for use on glass fibre and similar materials. Unique cutting geometry provides an easy cutting action and good surface finish on both hand and CNC operated applications. Also suitable for honeycomb cardboard and rigid paper board.

Metric Sizes (mm)

Catalogue No.	Size	Shank Diameter	Overall Length	Length of Cut
190-1181-30	3	3	38	12.5
190-1575-30	4	4	50	16
190-1969-30	5	5	50	16
190-2362-30	6	6	75	19
190-3150-30	8	8	64	22
190-3937-30	10	10	75	25
190-4724-30	12	12	75	25

Imperial Sizes (inches)

Catalogue No.	Size	Shank Diameter	Overall Length	Length of Cut
190-1215-30	1/16	1/8	1-1/2	3/16
190-2345-30	1/8	1/8	1-1/2	1/2
190-6555-30	1/4	1/4	2-1/2	3/4

9001 Series

Multi-Flute Router



Description

Multiple flute, solid carbide, right hand cut, plunging end cut. Available with diamond coating.

Application

Designed for use on glass filled and carbon fibre type materials. Diamond coated for extra life on abrasive materials.

Metric Sizes (mm)

Catalogue No.	Catalogue No. Coated	Size	Shank Diameter	Overall Length	Length of Cut
9001-3	9001-3E	3	3	64	20
9001-6	9001-6E	6	6	75	28
9001-8	9001-8E	8	8	75	28
9001-10	9001-10E	10	10	100	40
9001-12	9001-12E	12	12	100	40

When using Diamond coated tools on CNC Router Machine always set the tool length manually. Do not use the Tool Length Sensor.



BALANCED TOOLS FOR HIGH FREQUENCY SPINDLES

High frequency spindles incorporated into CNC cutting tables by manufacturers including, Zund, Esko, Summa and DYSS are now a common installation in the production areas of Sign Makers, Digital Printers and Graphics companies.

Operating at extremely high spindle speeds, many well in excess of 33,000 rpm, these high frequency spindles require precision, balanced cutting tools in order to operate at their full potential. Without balanced tools the quality of surface and edge finish of components will diminish rapidly. In addition, the cutting process will induce vibration and generate excessive heat, noise and stress in the spindle. As a result, tool and spindle life will be significantly reduced.

ITC manufacture a comprehensive range of balanced carbide tooling specially for these high frequency spindles available ex-stock from our factory. These tools are also available complete with stop rings for use in automatic tool changers.

If you are unsure whether you require a balanced tool for your machine please ask us.

Tel: +44 (0) 1827 304500

Email: sales@itc-ltd.co.uk

8001 Series Clearcut - Balanced

Single Flute Router



Description

Solid carbide single flute, upward spiral, 15° helix. Manufactured from Ultra Wear Resistant Micrograin Carbide, to extremely tight tolerances with a highly polished flute. **Balanced for use on high frequency spindles, 30,000+ RPM.**

Application

Designed to give an exceptional finish on perspex and acrylic materials. In some cases eliminating the need for flame polishing components after cutting. This range of tool also offers exceptional surface finish on foamex and similar materials.

Metric Sizes (mm)

Catalogue No.	Size	Shank Diameter	Overall Length	Length of Cut
8001-2-FB	2	6	50	7
8001-3-DB	3	3	40	12
8001-3-FB	3	6	50	11
8001-3-GB	3	3	64	21
8001-4-DB	4	4	50	15
8001-4-FB	4	6	50	11
8001-5-FB	5	6	50	12
8001-6-CB	6	6	58	21
8001-6-DB	6	6	75	26
8001-6-EB	6	6	58	14

Stop Rings

Stop rings fitted for use in automatic tool changers are available for all our 6mm shank tools.

Please call for details:

Tel: +44 (0) 1827 304500



Tech Tip

A minimal amount of coolant often improves the finish when cutting acrylic.

8002 Series - Balanced

Single Flute Router For Aluminium & ACM - Reinforced Shank



Description

Solid carbide single flute, upward spiral, 30° helix on reinforced 6mm shank, ideal for reducing number of collet changes, manufactured from Ultra Wear Resistant Micrograin Carbide. **Balanced for use on high frequency spindles, 30,000+ RPM.**

Application

Offers exceptional surface finish on aluminium and ACM.

Metric Sizes (mm)

Catalogue No.	Size	Shank Diameter	Overall Length	Length of Cut
8002-2B	2	6	50	7
8002-3B	3	6	50	10
8002-4B	4	6	50	10
8002-4XB	4	6	65	22
8002-5B	5	6	50	12
8002-6B	6	6	50	14

8002 Series - Vitreo Coated - Balanced

Single Flute Router For ACM



Description

Solid carbide single flute, upward spiral, 30° helix on reinforced 6mm shank, ideal for reducing number of collet changes, manufactured from Ultra Wear Resistant Micrograin Carbide. Coated for extra life. **Balanced for use on high frequency spindles, 30,000+ RPM.**

Application

Vitreo coated offers exceptional surface finish and tool life on ACM.

Metric Sizes (mm)

Catalogue No.	Size	Shank Diameter	Overall Length	Length of Cut
8002-2JB	2	6	50	7
8002-3JB	3	6	50	10
8002-4JB	4	6	50	10
8002-5JB	5	6	15	12
8002-6JB	6	6	50	14

8002 Series - Iridis Coated - Balanced

Single Flute Router For Aluminium



Application

Iridis coated offers exceptional surface finish and tool life on aluminium.

Metric Sizes (mm)

Catalogue No.	Size	Shank Diameter	Overall Length	Length of Cut
8002-2KB	2	6	50	7
8002-3KB	3	6	50	10
8002-4KB	4	6	50	10
8002-5KB	5	6	50	12
8002-6KB	6	6	50	14

8001 Series - Vitreo Coated - Balanced

Single Flute Router For Printed ACM



Description

Solid carbide single flute, upward spiral, 15° helix on reinforced 6mm shank, ideal for reducing number of collet changes, manufactured from Ultra Wear Resistant Micrograin Carbide. Coated for extra life. **Balanced for use on high frequency spindles.**

Application

Vitreo coated offers exceptional surface finish and tool life on Printed ACM. Prevents lifting of the vinyl printed layer.

Metric Sizes (mm)

Catalogue No.	Size	Shank Diameter	Overall Length	Length of Cut
8001-3-FJB	3	6	50	11
8001-4-FJB	4	6	50	11
8001-6-EJB	6	6	58	14

1001 Series

Single Flute Router For Aluminium & ACM



Description

Solid carbide single flute, upward spiral, 30° helix on reinforced 6mm shank, manufactured from Ultra Wear Resistant Micrograin Carbide. Vitreo coated for extra life. **Balanced for use on high frequency spindles, 30,000+ RPM.**

Application

Modified tool rake geometry especially suitable for aluminium and ACM. Offers exceptional surface finish at high spindle RPMs.

Metric Sizes (mm)

Catalogue No.	Size	Shank Diameter	Overall Length	Length of Cut
1001-2J	2	6	50	7
1001-3J	3	6	50	7
1001-4J	4	6	50	7
1001-6J	6	6	50	11

1001 Series

Single Flute Router For Steel Composite Panels



Application

Cupro coated especially suitable for galvanised steel composite panel and magnetic white board materials.

Metric Sizes (mm)

Catalogue No.	Size	Shank Diameter	Overall Length	Length of Cut
1001-6F	6	6	50	11

Recommended to be used at 15,000 RPM, 600mm/min feed rate.

8012 Series - Balanced

Long Series Single Flute Router



Description

Solid Carbide single flute, upward spiral 30° helix. Manufactured from Ultra Wear Resistant Micrograin Carbide, to extremely tight tolerances with exceptional surface finish. **Balanced for use on high frequency spindles 30,000+ RPM.**

Application

Offers exceptional surface finish on aluminium and ACM.

Metric Sizes (mm)

Catalogue No.	Size	Shank Diameter	Overall Length	Length of Cut
8012-3B	3	6	58	11
8012-4B	4	6	58	14
8012-6B	6	6	60	20
8012-6XXB	6	6	75	31

8013 Series - Balanced

Downward Spiral Single Flute Router For Aluminium & Plastics



Description

Solid carbide single flute, downward spiral, 30° helix. Manufactured from Ultra Wear Resistant Micrograin Carbide, to extremely tight tolerances with exceptional surface finish. **Balanced for use on high frequency spindles, 30,000+ RPM.**

Application

Designed for use on aluminium, acrylic and other non-ferrous materials. The downward spiral helps to hold the material down whilst cutting. Particularly suitable for thinner sheet.

Metric Sizes (mm)

Catalogue No.	Size	Shank Diameter	Overall Length	Length of Cut
8013-3B	3	6	58	11
8013-4B	4	6	58	14
8013-6B	6	6	58	14

8013 Series - Vitreo Coated - Balanced

Application

Vitreo coated offers exceptional surface finish and tool life on ACM.

Metric Sizes (mm)

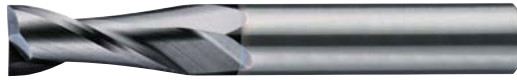
Catalogue No.	Size	Shank Diameter	Overall Length	Length of Cut
8013-3JB	3	6	58	11
8013-4JB	4	6	58	14
8013-6JB	6	6	58	14

Tech Tip

If coolant cannot be used a small amount of compressed air will resolve melting issues and improve surface finish.

2011 Series - Balanced

2 Flute Coated Router - AlTiN Coated



Description

2 flute solid carbide, upward spiral, 30° helix. Manufactured from Ultra Wear Resistant Micrograin Carbide, AlTiN coated. **Balanced for use on high frequency spindles, 30,000+ RPM.**

Application

Designed for applications requiring extra tool life, particularly suitable for cutting engraving laminates and fire retardant MDF.

Metric Sizes (mm)

Catalogue No.	Size	Shank Diameter	Overall Length	Length of Cut
2011-3.0C-6	3	6	50	11
2011-4.0C-6	4	6	50	14
2011-6.0C	6	6	64	19
2011-6.0C-L	6	6	64	26

Tech Tip

Clean collets and locknuts during every tool change.

Di-Bond Folding Tool - Balanced



Description

Solid carbide 2 flute, 1/2" head diameter, with a 90° or 135° inclusive angle and a 3mm flat.

Application

The Di-Bond folding tools enable precise folding of Di-Bond and similar aluminium composite materials typically up to 5mm thick.

Balanced for use on high frequency spindles 30,000+ RPM.

Sizes

Catalogue No.	Size	Shank Diameter	Inclusive Angle	Width of Flat	Overall Length
2021-90-6-BAL	1/2"	6mm	90°	3mm	64mm
2021-135-6-BAL	1/2"	6mm	135°	3mm	64mm

Di-Bond Folding Tool - Helical Flute - Balanced



Application

As above, but tool is helical flute with a more rigid body for improved cutting speeds. **Balanced for use on high frequency spindles 30,000+ RPM.**

Sizes

Catalogue No.	Size	Shank Diameter	Inclusive Angle	Width of Flat	Overall Length
2421-90-6	10	6	90°	3	76

Vee Groove Tool - Balanced



Description

Solid carbide 2 flute, 1/2" head diameter, with a 90° inclusive angle. **Balanced for use on high frequency spindles 30,000+ RPM.**

Application

90° vee groove tool suitable for a wide variety of materials.

Sizes

Catalogue No.	Size	Shank Diameter	Inclusive Angle	Overall Length
2221-90-6	1/2"	6mm	90°	63mm

Chamfer Tool - Balanced



Description

Solid carbide 2 flute, 90° inclusive angle. **Balanced for use on high frequency spindles 30,000+ RPM.**

Application

Chamfering at 45° for a wide variety of materials.

Metric Sizes (mm)

Catalogue No.	Size	Shank Diameter	Inclusive Angle	Width Flat	Overall Length
2222-90-6	6	6	90	1	64

D Series Tools for Superior Engraving - Balanced

One Dimensional Engraving Tools



Description

The D series is solid carbide and available in three different angles; 30°, 60° and 90° inclusive. Other sizes are available on request.

Balanced for use on high frequency spindles, 30,000+ RPM.

Application

Designed to give superior performance when engraving a variety of materials from plastics to steels.

One Dimensional




















Catalogue No.	Included Angle	Diameter	Overall Length	Split Length
ENG-6.0-30-BAL	30°	6	57	8
ENG-6.0-60-BAL	60°	6	57	8
ENG-6.0-90-BAL	90°	6	57	8

Flat Drag Knife Blades

Description

Solid Carbide Knife Blades, comparable and compatible with OEM (Original Equipment Manufacturer) products.

Metric Sizes (mm)

Part No.	Image	Cut Angle	Lip Angle	Overall Length	Length of Cut	Width	Thickness	Material	Pack Size
BDF-10		50	34	50	4.8	8	1.5	Robust double edged carbide general purpose drag knife	1
BDF-11		60	24	50	6.9	8	1.5	Robust double edged carbide general purpose drag knife	1
BDF-12DE		50	34	50	4.8	8	1.5	Robust double ended; double edged general purpose carbide drag knife	1
BDF-13DE		60	24	50	6.9	8	1.5	Robust double ended; double edged general purpose carbide drag knife	1
BDF-16		55	30	25	12	5.65	0.63	Single carbide general purpose drag knife for soft materials	2
BDF-17		65	30	25	14.3	5.65	0.63	Single carbide general purpose drag knife for thin materials inc. leather	2
BDF-30		50	20	14.5	2	3.25	0.63	Small single carbide drag knife for sharp corners, ideal for cutting mats	5
BDF-32		45	-	52	2.7/4.9	5.6	0.63	HSS fabric drag knife	10
BDF-35		52	15	26	5	13	0.63	Double edged carbide drag knife ideal for cutting mats	2
BDF-44		60/90	30	50	14	8	1.5	Double edged carbide drag knife ideal for carpet and tarpaulin	1
BDF-46		45/90	20	50	20	5.9	1.5	Single carbide drag knife ideal for fabrics, carpet and tarpaulin	1
BDF-70		90	-	43	10/15.6	5.6	0.63	V cut carbide drag knife for corrugated board	1
BDF-71		90	-	50	16/18.4	8	1	V cut carbide drag knife for corrugated board	1
BDF-73		90	-	60	16/18.2	59.5	0.9	HSS V cut drag knife for corrugated board	10
BDF-83		50	17	50	4.6	8	1.5	Asymmetric carbide knife for thin materials such as magnetic foil and foam	1
BDF-101		60	-	50	6.8	8	1.5	Magnetic foil, polycarbonate, folding carton, hard foam	1
BDF-112		50	34	24.5	4.8	8	1.5	Carbide knife for thin materials such as foils, canvas and fabric	2
BDF-113		60	24	24.5	6.9	8	1.5	Carbide knife for thin materials such as foils, canvas and fabric	2
BDF-784		-	-	29	6.5	5.6	0.63	Small single hss knife blade for cutting thin material	10

Tech Tip

Please contact us with your OEM part number for our equivalent.

WE STOCK A WIDE RANGE OF KNIFE BLADES
Please ask if you can't find what you're looking for

Round Shank Drag Knife Blades

Metric Sizes (mm)

Part No.	Image	Cut Angle	Lip Angle	Overall Length	Length of Cut	Shank Diameter	Material	Pack Size
BDR-1		35	40	18.5	1	3	Carbide kisscut knife blade suitable for foils	10
BDR-2		35	30	18.5	1	3	Carbide knife blade for adhesive vinyl	10
BDR-3		35	40	18.5	1	3	Double edged carbide kisscut knife blade suitable for vinyl and foil	10
BDR-4		55	25	18.5	2.1	3	Fine tipped carbide kisscut knife blade suitable for sandblast and reflective vinyls	10
BDR-5		60	20	18.5	2.6	3	Slim single carbide kisscut blade for soft materials	10
BDR-116		60	30	40	13	8	Single edge carbide knife suitable for rigid material such as forex	1
BDR-117		50	30	40	7	8	Similar to BDR-116, shorter, sturdy blade for tough materials	1
BDR-150		60	12	25	5	6	Single edge carbide knife for thin flexible materials	1
BDR-212		60	24	40	6	6	Double edged carbide knife for thin, rigid materials	1
BDR-213		50	34	40	5	8	Double edged carbide knife for thin, rigid materials	1
BDR-214		60	12	25	5	6	Double edged carbide knife for thin, flexible materials	1
BDR-223		60	40	40	12	6	Carbide knife blade for corrugated materials	1
BDR-224		66	34	40	12	6	Carbide knife blade for corrugated materials	1
BDR-310		45/79	34	40	20	6	Carbide knife ideal for triple wall corrugated	1
BDR-312		45/84	40	52	32	6	Carbide knife blade for foam	1
BDR-8170		30	12	40	6.5	8	Single edge carbide knife for vinyls and foamboard	1
BDR-8171A		60	30	40	6.9	8	Asymmetric carbide knife for thin plastics, foam and vinyl	1
BDR-8172		50	40	40	4.8	-	Carbide knife for paper, vinyls and folding carton	1
BDR-1010		79	22	36	10	6	Gasket materials, packaging, foamed materials, rubber	1
BDR-1015		70	20	36	15	6	Gasket materials, packaging, foamed materials, rubber	1
BDR-S35D		35	24	20	0.25	2.5	Paper, adhesive vinyl, adhesive pvc, banner vinyl	5
BDR-S36T		36	21	31	0.25	2.5	Paper, adhesive vinyl, sandblast material, window film, magnetic foil	5
BDR-S36T2		36	26	31	0.8	2.5	Paper, adhesive vinyl, sandblast material, window film, magnetic foil	5
BDR-S45T		45	24	31	1	2.5	Paper, adhesive vinyl, sandblast material, window film, magnetic foil	5
BDR-S60T		60	24	31	1.2	2.5	Paper, adhesive vinyl, sandblast material, window film, magnetic foil	5
BDR-S60D2		60	29	20	0.6	2.5	Paper, adhesive vinyl, adhesive pvc, banner vinyl	5
BDR-W1		35	40	18.5	1	3	Single wild plotter knife blade for magnetic foil	5
BDR-W5		30	30	18.5	0.8	3	Self-adhesive foil, magnetic foil, reflective vinyl, poly carbonate, masking film	5
BDR-W9		45	30	18.5	2.8	3	Self-adhesive foil, diamond grade foil	5

Oscillating Blades




Metric Sizes (mm)

Part No.	Image	Cut Angle	Lip Angle	Overall Length	Length of Cut	Width	Thickness	Material	Pack Size
BOP-20		63/84	30	25	14.3	4	0.63	Fine oscillating general purpose carbide knife blade for intricate details	2
BOP-21		63/84	30	28	17.2	4	0.63	Fine oscillating general purpose carbide knife blade for intricate details	2
BOP-22		63/79	30	25	14	4	0.63	Fine oscillating general purpose carbide knife blade for intricate details similar to BOP-20 but more robust	2
BOP-23		45/84.5	30	33	22	4	0.63	Long carbide oscillating general purpose (except leather) knife for intricate details	1
BOP-25		15/65	30	25	8.7	5.65	0.63	Flat tip carbide oscillating knife for rubber and card stock	2
BOP-26		22/63	30	25	8.7	5.65	0.63	Carbide oscillating knife for fabrics	2
BOP-28		45/86	30	38	26	4	0.63	Long carbide oscillating knife blade for soft materials e.g foam	2
BOP-29		45/86.3	30	43	31	4	0.63	Extra long carbide oscillating knife blade for soft materials e.g foam	2
BOP-41		15/80	20	25	11.3	4.4	0.63	Carbide oscillating knife with pre-cut for fabrics	2
BOP-42		15/55	40	28	7.8	5.5	0.63	Carbide oscillating knife for fabrics	2
BOP-60		55/81.5	-	28	16.5	5.5	1.5	Sturdy carbide oscillating knife for tough materials	2
BOP-61		35/81.5	24	31.5	20	5.5	1.5	Heavy duty carbide oscillating knife with flat edge	2
BOP-62		15/80	20	28	13.2	4.4	0.63	Long carbide oscillating knife with pre-cut for fabrics	2
BOP-66		60/87.5	-	67	55	5.75	1.5	Long carbide oscillating knife with serrated edge	1
BOP-68		5/83	30	41	29	5.5	1.5	Carbide oscillating knife for sandwich materials	2
BOP-104		17.5/80	30	29	11	5.6	0.63	Carbide oscillating knife for corrugated board	2
BOP-175		11/70	20	25	11	5.6	0.63	Carbide oscillating knife for nylon fabrics and leather hide	2
BOP-303		3.5/60	-	40	20	4	6	Carbide oscillating knife for ejection rubber and expanded polystyrene	2
BOP-831		12/83	28	39.2	25	5.65	6	Carbide oscillating knife for reboard	2

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Please ask if you can't find what you're looking for

Rotation Blades

Metric Sizes (mm)

Part No.	Image	Cut Angle	Lip Angle	Overall Length	Length of Cut	Width	Thickness	Material	Pack Size
BRR-25		36	20	25/8	3.5	25	0.6	10-sided carbide rotary knife blade for fabrics	1
BRR-28		36	20	28/8	5	28	0.6	10-sided carbide rotary knife blade for fabrics	1
BRR-32		36	20	32/8	7	32	0.6	10-sided carbide rotary knife blade for fabrics	1

General Purpose Material

General Purpose Materials	General Purpose – Oscillating
Canvas	Carpet
Cardboard	Corrugated Cardboard
Carpet	Corrugated Plastic
Foil	Foam
Paper	Foam Board
Paperboard	Honeycomb
Plastic Sheet	Leather Hide
Tarpaulins	Leather Suede
Vinyl	Magnetic Foil
-	Paperboard

WE STOCK A WIDE RANGE OF KNIFE BLADES
Please ask if you can't find what you're looking for

Edge & Radius Router



Description

Solid carbide, straight flute router. **Made to order.**

Application

Designed to produce a radius or chamfer whilst trimming. Ideal for 19mm foam, PVC and similar models.

Metric Sizes (mm)

Catalogue No.	Radius Size	Shank Diameter	Overall Length	Pilot Diameter	Pilot Length
2191-12-3	3	12	76	5.5	16.25

Edge & Chamfer Router



Metric Sizes (mm)

Catalogue No.	Chamfer Size	Shank Diameter	Overall Length	Pilot Diameter	Pilot Length
2181-16-5	5.25	12	76	5.5	14

Pilot lengths can be reduced to suit material thickness below 19mm. Please contact us to discuss your requirements.

Tech Tip

Look after your tools. Always replace them in their protective packet when not in use.

3071 Series

Bed Skimming Tool



Description

TCT Router for bed skimming application.

Sizes

Catalogue No.	Size	Shank Diameter
3071-25	25	1/4"
3071-32	32	1/2"
3071-50	50	1/2"

Tech Tip

If you require help or advice on your choice of tool please do not hesitate to call us.

Carbide Tipped Routers

For woodworking



Chamfer / V-Groove



Ovolo / Round Over



3 Wing Surfacing Tool

In addition to our comprehensive range of solid carbide router tooling, we are pleased to offer a full range of woodwork tooling for next day delivery.

Other styles including: Dovetail, Ogee, Panel Raiser, Jointing, Trimming & Bearing Mounted Tooling all available for next day delivery.

Please call us with your requirements, we will also advise on cutter selection.

ITC are also pleased to be resellers of the brands below:

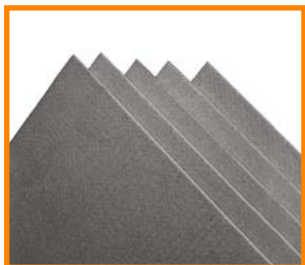


titman
a brand of Elektron Technology



Tech Tip

If you require something you cannot find in this catalogue please call ITC Sales.



Sacrificial Sheets

ITC's sacrificial sheets provide a highly porous, sacrificial surface for CNC routing machines, to protect the machine bed and tool and maximise vacuum hold down.

- 1550mm x 1220mm x 3.0mm
- Sold in packs of 5



Coolant **BUY 5 LITRES BUT PAY FOR ONLY 4**

ITC's minimal amount lubricant is designed to give superior performance in signmaking and engraving applications:

- Very economical
- Prolonged tool life
- Improved surface finish
- Biodegradable



Anti-Slip Matting Sheets

- 1600mm x 1000mm
- Underlay suitable for high speed cutting tables
- Sold individually

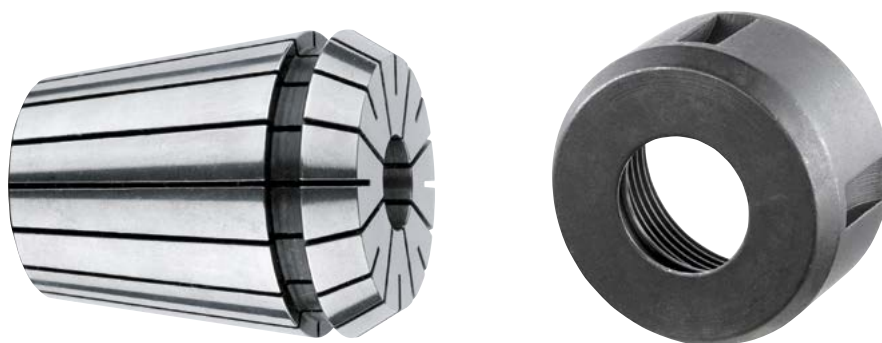


Anti-Slip Matting Rolls

Available sizes:

- 1.5m x 30m
- 1m x 30m

Router Collets



Description

ITC stock a comprehensive range of metric and imperial collets and lock nuts to suit both Perske and Rego-fix motors. Typically the collets requested are Perske VS31 & VS50 plus Rego-fix ER16, ER20, ER25, ER32 & ER40.

Sizes (mm)

Style	Diameter	Length	Capacity
ER16	17	27.5	1-10
ER20	21	31.5	1-13
ER25	26	34	1-16
ER32	33	44	2-20
ER40	41	46	3-26
VS31(401E)	14.5	26	2-8
VS50(407E)	20	34	2-12

Collet System Care

Collet system locknuts and collets should be treated as consumable items. Over a period of use collets will eventually lose their full gripping capacity and need to be replaced. Ideally at every tool change the collet should be cleaned to remove any build up of waste material on its surface and checked for burrs in the gripping and locating areas. Any collet found to have burrs should be replaced, as this is a prime source of broken cutting tools.

The locknut should be cleaned at every tool change. The clamping surfaces and thread should also be examined for wear and burrs. The locknut should be replaced if there are any signs of wear or burrs, which will prevent the collet running concentrically in use. If the collet is not locating correctly in the locknut there is also a potential for premature failure of the cutting tool in use.

Tech Tip

Replace collets regularly. They are a consumable item and will wear with use.

ITC CAN SUPPLY ALL OF YOUR TOOL HOLDER REQUIREMENTS...

High quality tool holders can be supplied to suit all spindle interfaces,
e.g. ISO30, HSK 63F, amongst others.

Contact us for further information
and advice on your requirements:

Tel: +44 (0) 1827 304500

Email: sales@itc-ltd.co.uk



Decimal (mm)	Sizes	Decimal (inches)	Decimal (mm)	Sizes	Decimal (inches)	Decimal (mm)	Sizes	Decimal (inches)	Decimal (mm)	Sizes	Decimal (inches)	Decimal (mm)	Sizes	Decimal (inches)
.794	1/32	.0312	2.383	3/32	.0938	4.700	13	.1850	7.366	L	.2900	12.000	-	.4724
.800	-	.0315	2.400	-	.0945	4.750	-	.1870	7.400	-	.2913	12.304	31/64	.4844
.813	67	.0320	2.438	41	.0960	4.763	3/16	.1875	7.493	M	.2950	12.500	-	.4921
.838	66	.0330	2.450	-	.0965	4.800	12	.1890	7.500	-	.2953	112.700	1/2	.5000
.851	-	.0335	2.489	40	.0980	4.850	11	.1910	7.541	19/64	.2969	13.000	-	.5118
.889	65	.0350	2.500	-	.0984	4.900	-	.1929	7.600	-	.2992	13.096	33/64	.5156
.900	-	.0354	2.527	39	.0995	4.915	10	.1935	7.671	N	.3020	13.492	17/32	.5312
.914	64	.0360	2.578	38	.1015	4.978	9	.1960	7.700	-	.3031	13.500	-	.5315
.940	63	.0370	2.600	-	.1024	5.000	-	.1969	7.750	-	.3051	13.891	35/64	.5469
.950	-	.0374	2.642	37	.1040	5.055	8	.1990	7.800	-	.3071	14.000	-	.5512
.965	62	.0380	2.700	-	.1063	5.100	-	.2008	7.900	-	.3110	14.287	9/16	.5625
.991	61	.0390	2.705	36	.1065	5.105	7	.2010	7.938	5/16	.3125	14.500	-	.5709
1.000	-	.0394	2.750	-	.1083	5.159	13/64	.2031	8.000	-	.3150	14.684	37/64	.5781
1.016	60	.0400	2.779	7/64	.1094	5.182	6	.2040	8.026	O	.3160	15.000	-	.5906
1.041	59	.0410	2.794	35	.1100	5.200	-	.2047	8.100	-	.3189	15.083	19/32	.5938
1.049	-	.0413	2.800	-	.1102	5.220	5	.2055	8.200	-	.3228	15.479	39/64	.6094
1.067	58	.0420	2.819	34	.1110	5.250	-	.2067	8.204	P	.3230	15.500	-	.6120
1.092	57	.0430	.2870	33	.1130	5.300	-	.2087	8.250	-	.3248	15.875	5/8	.6250
1.100	-	.0433	2.900	-	.1142	5.309	4	.2090	8.300	-	.3268	16.000	-	.6299
1.151	-	.0453	2.946	32	.1160	5.400	-	.2126	8.334	21/64	.3281	16.271	41/64	.6406
1.181	56	.0465	3.000	-	.1181	5.410	3	.2130	8.400	-	.3307	16.500	-	.6496
1.191	3/64	.0469	3.048	31	.1200	5.500	-	.2165	8.433	Q	.3320	16.667	21/32	.6562
1.200	-	.0472	3.100	-	.1220	5.558	7/32	.2188	8.500	-	.3346	17.000	-	.6693
1.250	-	.0492	3.175	1/8	.1250	5.600	-	.2205	8.600	-	.3386	17.066	43/64	.6719
1.300	-	.0512	3.200	-	.1260	5.613	2	.2210	8.611	R	.3390	17.463	11/16	.6875
1.321	55	.0520	3.250	-	.1280	5.700	-	.2244	8.700	-	.3425	17.500	-	.6890
1.349	-	.0531	3.264	30	.1285	5.750	-	.2264	8.733	11/32	.3438	17.859	45/64	.7031
1.397	54	.0550	3.300	-	.1299	5.791	I	.2280	8.750	-	.3445	18.000	-	.7087
1.400	-	.0551	3.400	-	.1339	5.800	-	.2283	8.800	-	.3465	18.258	13/32	.7188
1.450	-	.0571	3.454	29	.1360	5.900	-	.2323	8.839	S	.3480	18.500	-	.7283
1.500	-	.0591	3.500	-	.1378	5.944	A	.2340	8.900	-	.3504	18.654	47/64	.7344
1.511	53	.0595	3.569	28	.1405	5.954	15/64	.2344	9.000	-	.3543	19.000	-	.7480
1.550	-	.0610	3.571	9/64	.1406	6.000	-	.2362	9.093	T	.3580	19.050	3/4	.7500
1.588	1/16	.0625	3.600	-	.1417	6.045	B	.2380	9.100	-	.3583	19.446	49/64	.7656
1.600	-	.0630	3.658	27	.1440	6.100	-	.2402	9.129	23/64	.3594	19.500	-	.7677
1.613	52	.0635	3.700	-	.1457	6.147	C	.2420	9.200	-	.3622	19.842	25/32	.7812
1.650	-	.0650	7.734	26	.1470	6.200	-	.2441	9.250	-	.3642	20.000	-	.7874
1.700	-	.0669	3.750	-	.1476	6.248	D	.2460	9.300	-	.3661	20.241	51/64	.7969
1.702	51	.0670	3.797	25	.1495	6.250	-	.2461	9.347	U	.3680	20.500	-	.8071
1.750	-	.0689	3.800	-	.1496	6.300	-	.2480	9.400	-	.3701	20.638	13/16	.8125
1.778	50	.0700	3.861	24	.1520	6.350	E	.2500	9.500	-	.3740	21.000	-	.8268
1.800	-	.0709	3.900	-	.1536	6.350	1/4	.2500	9.525	3/8	.3750	21.034	53/64	.8281
10850	-	.0728	3.912	23	.1540	6.400	-	.2520	9.576	V	.3770	21.433	27/32	.8438
1.854	49	.0730	3.962	5/32	.1562	6.500	-	.2559	9.600	-	.3780	21.500	-	.8465
1.900	-	.0748	3.988	22	.1570	6.528	F	.2570	9.700	-	.3819	21.829	55/64	.8594
1.930	48	.0760	4.000	-	.1575	6.600	-	.2598	9.750	-	.3839	22.000	-	.8661
1.950	-	.0768	4.039	21	.1590	6.629	G	.2610	9.800	-	.3858	22.225	7/8	.8750
1.984	5/64	.0781	4.089	20	.1610	6.700	-	.2638	9.804	W	.3860	22.500	-	.8858
1.994	47	.0785	4.100	-	.1614	6.746	17/64	.2656	9.900	-	.3898	22.261	57/64	.8906
2.000	-	.0787	4.200	-	.1654	6.750	-	.2657	9.921	25/64	.3906	23.000	-	.9055
2.050	-	.0807	4.216	19	.1660	6.756	H	.2660	10.000	-	.3937	23.017	29/32	.9062
2.057	46	.0810	4.250	-	.1673	6.800	-	.2677	10.084	X	.3970	23.416	59/64	.9219
2.083	45	.0820	4.300	-	.1693	6.900	-	.2717	10.262	Y	.4040	23.500	-	.9252
2.100	-	.0827	4.305	18	.1695	6.909	I	.2720	10.317	13/32	.4062	23.813	15/16	.9375
2.150	-	.0846	4.366	11/64	.1719	7.000	-	.2756	10.490	Z	.4130	24.000	-	.9449
2.184	44	.0860	4.394	17	.1730	7.036	J	.2770	10.500	-	.4134	24.209	61/64	.9531
2.200	-	.0866	4.400	-	.1732	7.100	-	.2795	10.716	27/64	.4219	24.500	-	.9646
2.250	-	.0886	4.496	16	.1770	7.137	K	.2810	11.000	-	.4331	24.608	31/32	.9688
2.260	43	.0890	4.500	-	.1772	7.142	9/32	.2812	11.113	7/16	.4375	25.000	-	.9843
2.300	-	.0906	4.572	15	.1800	7.200	-	.2835	11.500	-	.4528	25.004	63/64	.9844
2.350	-	.0925	4.600	-	.1811	7.250	-	.2854	11.509	29/64	.4531	25.400	-	1.000
2.375	42	.0935	4.623	14	.1820	7.300	-	.2874	11.908	18/32	.4688	-	-	-

Conversion Tables

Imperial to Metric

Multiply	By	To Obtain
Inches	25.4	Millimetres
Inches	2.54	Centimetres
Feet	.3048	Metres
Inches per minute	25.4	Millimetres per minute
Cubic Inches per minute	16.387	Cubic Centimetres per minute
Surface Feet per minute	.3048	Surface Metres per minute

Metric to Imperial

Multiply	By	To Obtain
Millimetres	.0394	Inches
Centimetres	.3937	Inches
Metres	3.2808	Feet
Millimetres per minute	.0394	Inches per minute
Cubic Centimetres per minute	.0610	Cubic Inches per minute
Surface Metres per minute	3.2808	Surface Feet per minute

Cutting Tool Usage Safety Information

Essential Safety Instructions

Tool Usage Hazards

In use, cutting tools may create sharp edges, vibrations, high temperatures and forces not only within the tool itself but also the work piece and waste produced. This can cause fragmentation of the tool and/or work piece due to excess stress or impact damage.

Avoiding Injury

When working with, or in the vicinity of cutting tools, all personnel should wear appropriate protective equipment at all times. Machine guards should be in place at all times.

Please Note:

It is the user's responsibility to determine the suitability of any tool for their specific application and ensure its safe usage.

1. Interpretation

1.1. The definitions and rules of interpretation in this condition apply in these conditions.

"Buyer"	the person, firm or company who purchases the Goods from ITC;
"ITC"	Industrial Tooling Corporation Limited [Company No. 2573537] the registered office of which is at Cyber House, Unit 1 Kepler, Lichfield Road Industrial Estate, Tamworth, B79 7XE;
"Contract"	any contract between ITC and the Buyer for the sale and purchase of the Goods, incorporating these conditions;
"Delivery Point"	the place where delivery of the Goods is to take place under condition 4, any goods agreed in the Contract to be supplied to the Buyer by ITC (including any part or parts of them);
"Intellectual Property"	any copyrights, letters, patents, know how, inventions, utility models, registered and unregistered designs, trade and service marks, trade names, logos, patent applications, rights in the nature of copyrights and all other similar rights in the Goods and (where applicable) the Services; and
"Services"	any services agreed in the Contract to be supplied to the Buyer by ITC.

1.2. A reference to a particular law is a reference to it as it is in force for the time being taking account of any amendment, extension, application or re-enactment and includes any subordinate legislation for the time being in force made under it.

1.3. Words in the singular include the plural and in the plural include the singular.

1.4. A reference to one gender includes a reference to the other gender.

1.5. Condition headings do not affect the interpretation of these conditions.

2. Application of terms

2.1. Subject to any variation under condition 2.3 the Contract shall be on these conditions to the exclusion of all other terms and conditions (including any terms or conditions which the Buyer purports to apply under any purchase order, confirmation of order, specification or other document).

2.2. No terms or conditions endorsed on, delivered with or contained in the Buyer's purchase order, confirmation of order, specification or other document form part of the Contract simply as a result of such document being referred to in the Contract.

2.3. These conditions apply to all ITC's sales and any variation to these conditions and any representations about the Goods or the Services shall have no effect unless expressly agreed in writing and signed by a director of ITC. The Buyer acknowledges that it has not relied on any statement, promise or representation made or given by or on behalf of ITC which is not set out in the Contract. Nothing in this condition shall exclude or limit ITC's liability for fraudulent misrepresentation.

2.4. Each order or acceptance of a quotation for Goods or Services by the Buyer from ITC shall be deemed to be an offer by the Buyer to buy Goods and/or Services subject to these conditions. The Buyer shall ensure that the minimum value of its order is not less than the sum set out in clause 7.2.

2.5. No order placed by the Buyer shall be deemed to be accepted by ITC until a written acknowledgement of order is issued by ITC or (if earlier) ITC delivers the Goods to the Buyer or provides the Services to the Buyer.

2.6. The Buyer shall ensure that the terms of its order and any applicable specification are complete and accurate.

2.7. Any quotation is given on the basis that no Contract shall come into existence until ITC despatches an acknowledgement of order to the Buyer. Any quotation is valid for a period of 60 days only from its date, provided that ITC has not previously withdrawn it.

2.8. Acceptance of delivery of the Goods or performance of the Services shall be deemed conclusive evidence of the Buyer's acceptance of these Conditions.

2.9. Any typographical, clerical or other error or omission in any sales literature, quotation, acceptance of offer, invoice or other document or information issued by ITC shall be subject to correction without any liability on the part of ITC.

3. Description

3.1. The quantity and description of the Goods or the Services to be performed shall be as set out in ITC's quotation or acknowledgement of order.

3.2. All samples, drawings, descriptive matter, specifications and advertising issued by ITC and any descriptions or illustrations contained in ITC's catalogues or brochures are issued or published for the sole purpose of giving an approximate idea of the Goods described in them. They shall not form part of the Contract and this is not a sale by sample.

3.3. If the Goods are to be manufactured or as part of the Services any process is to be applied to the Goods by ITC, or if the Goods or Services are to be provided in accordance with a specification or any other document, data information or materials submitted by the Buyer, the Buyer shall indemnify ITC against all loss, damages, costs and expenses awarded against or incurred by ITC in connection with or paid or agreed to be paid by ITC in settlement of any claim for infringement of any patent, copyright, design, trade mark or other industrial or intellectual property rights of any other person which results from ITC's use of the Buyer's information.

3.4. ITC reserves the right to make any changes in the specification of the Goods which are required to conform with any applicable statutory or EC requirements or, where the Goods are to be supplied to ITC's specification, which do not materially affect their quality or performance.

3.5. No order which has been accepted by ITC may be cancelled by the Buyer except with the agreement in writing of ITC and on terms that the Buyer shall indemnify ITC in full against all loss (including without prejudice to the generality of the foregoing loss of profit), costs (including without prejudice to the generality of the foregoing the cost of all labour and materials ordered, whether used or un-used), damages, charges and expenses incurred by ITC as a result of cancellation.

4. Delivery

4.1. Unless otherwise agreed in writing by ITC, delivery of the Goods shall take place at ITC's place of business.

4.2. The Buyer shall take delivery of the Goods within 7 days of ITC giving it notice that the Goods are ready for delivery.

4.3. Any dates specified by ITC for delivery of the Goods or the performance of the Services are intended to be an estimate and time for delivery shall not be made of the essence by notice. If no dates are so specified, delivery and performance shall be within a reasonable time.

4.4. Subject to the other provisions of these conditions ITC shall not be liable for any direct, indirect or consequential loss (all three of which terms include, without limitation, pure economic loss, loss of profits, loss of business, depletion of goodwill and similar loss), costs, damages, charges or expenses caused or incurred directly or indirectly by any delay in the delivery of the Goods or the performance of the Services (even if caused by ITC's negligence), nor shall any delay entitle the Buyer to terminate or rescind the Contract unless such delay exceeds 180 days.

4.5. If for any reason the Buyer fails to accept delivery of any of the Goods when they are ready for delivery, or if ITC is unable to deliver the Goods on time because the Buyer has not provided appropriate instructions, documents, licences or authorisations:

4.5.1. risk in the Goods shall pass to the Buyer;

4.5.2. the Goods shall be deemed to have been delivered;

4.5.3. ITC may store the Goods until delivery, whereupon the Buyer shall be liable for all related costs and expenses (including, without limitation, storage and insurance); and

4.5.4. sell the Goods at the best price readily attainable and (after deducting any costs for storage and other selling expenses) account to the Buyer for the excess over the price or charge the Buyer for any shortfall below the price under the Contract.

4.6. The Buyer shall provide at the Delivery Point and at its expense adequate and appropriate equipment and manual labour for loading the Goods.

4.7. If ITC delivers to the Buyer a quantity of Goods (being bespoke, non-stock items) of up to 10% more or less than the quantity accepted by ITC, the Buyer shall not be entitled to object to or reject the Goods or any of them by reason of the surplus or shortfall and shall pay for such goods at the pro rata Contract rate.

4.8. ITC may deliver the Goods by separate instalments. Each separate instalment shall be invoiced and paid for in accordance with the provisions of the Contract.

4.9. Each instalment shall be a separate Contract and no cancellation or termination of any one Contract relating to an instalment shall entitle the Buyer to repudiate or cancel any other Contract or instalment.

5. Non-delivery

5.1. The quantity of any consignment of Goods as recorded by ITC on despatch from ITC's place of business shall be conclusive evidence of the quantity received by the Buyer on delivery unless the Buyer can provide conclusive evidence to the contrary.

5.2. ITC shall not be liable for any non-delivery of Goods (even if caused by ITC's negligence) unless the Buyer gives written notice to ITC of the non-delivery within 3 days of the date when the Goods would in the ordinary course of events have been received.

5.3. Any liability of ITC for non-delivery of the Goods shall be limited to replacing the Goods within a reasonable time or, unless a credit note at the pro rata Contract rate against any invoice raised for such Goods.

6. Risk/Title

6.1. Risk of damage to or loss of the Goods shall pass to the Buyer:

6.1.1. in the case of Goods to be delivered at ITC's premises, at the time when ITC notifies the Buyer that the Goods are available for collection; or

6.1.2. in the case of Goods to be delivered otherwise than at ITC's premises, at the time of delivery or, if the Buyer wrongfully fails to take delivery of the Goods, the time when ITC has tendered delivery of the Goods.

6.1.3. in respect of deliveries made in accordance with clause 6.1(b) above and notwithstanding any other provision contained in these Conditions, a transportation insurance policy shall be taken only at the Buyer's written request and at the Buyer's expense.

6.2. Ownership of the Goods shall not pass to the Buyer until ITC has received in full (in cash

or cleared funds) all sums due to it in respect of:

6.2.1. the Goods; and

6.2.2. all other sums which are or which become due to ITC from the Buyer on any account.

6.3. Until ownership of the Goods has passed to the Buyer, the Buyer shall:

6.3.1. hold the Goods on a fiduciary basis as ITC's bailee;

6.3.2. store each consignment of the Goods (at no cost to ITC) separately from all other goods purchased from ITC and those of the Buyer or any third party in such a way that they remain readily identifiable as ITC's property;

6.3.3. not remove, destroy, deface or obscure any identifying mark or packaging on or relating to the Goods; and

6.3.4. maintain the Goods in satisfactory condition and keep them insured on ITC's behalf for their full price against all risks to the reasonable satisfaction of ITC. On request the Buyer shall produce the policy of insurance to ITC.

6.4. The Buyer may resell the Goods before ownership has passed to it solely on the following conditions:

6.4.1. any sale shall be effected in the ordinary course of the Buyer's business at full market value; and

6.4.2. any such sale shall be a sale of ITC's property on the Buyer's own behalf and the Buyer shall deal as principal when making such a sale.

6.5. The Buyer's right to possession of the Goods shall terminate immediately if:

6.5.1. the Buyer has a bankruptcy order made against him or makes an arrangement or composition with his creditors, or otherwise takes the benefit of any statutory provision for the time being in force for the relief of insolvent debtors, or (being a body corporate) convenes a meeting of creditors (whether formal or informal), or enters into liquidation (whether voluntary or compulsory) except a solvent voluntary liquidation for the purpose only of reconstruction or amalgamation, or has a receiver and/or manager, administrator or administrative receiver appointed of its undertaking or any part thereof, or documents are filed with the court for the appointment of an administrator of the Buyer or notice of intention to appoint an administrator is given by the Buyer or its directors or by a qualifying floating charge holder (as defined in paragraph 14 of Schedule B1 to the Insolvency Act 1986), or a resolution is passed or a petition presented to any court for the winding-up of the Buyer or for the granting of an administration order in respect of the Buyer, or any proceedings are commenced relating to the insolvency or possible insolvency of the Buyer; or

6.5.2. the Buyer suffers or allows any execution, whether legal or equitable, to be levied on his property or obtained against him, or fails to observe or perform any of his obligations under the Contract or any other contract between ITC and the Buyer, or is unable to pay its debts within the meaning of section 123 of the Insolvency Act 1986 or the Buyer ceases to trade; or

6.5.3. the Buyer encumbers or in any way charges any of the Goods.

6.6. ITC shall be entitled to recover payment for the Goods or the Services notwithstanding that ownership of any of the Goods has not passed from ITC.

6.7. The Buyer grants ITC, its agents and employees an irrevocable licence at any time to enter any premises where the Goods are or may be stored in order to inspect them, or, where the Buyer's right to possession has terminated, to recover them.

6.8. Where ITC is unable to determine whether any Goods are the goods in respect of which the Buyer's right to possession has terminated, the Buyer shall be deemed to have sold all goods of the kind sold by the Buyer to the Buyer in the order in which they were invoiced to the Buyer.

6.9. On termination of the Contract, howsoever caused, ITC's (but not the Buyer's) rights contained in this condition 6 shall remain in effect.

7. Price

7.1. Unless otherwise agreed by ITC in writing, the price for the Goods shall be the price set out in ITC's price list published on the date of delivery or deemed delivery. The price for the Services shall be in accordance with the quotation provided by ITC to the Buyer in accordance with clause 3.1.

7.2. The minimum value of the Buyer's order shall be not less than £20.00.

7.3. The price for the Goods shall be exclusive of any value added tax and all costs or charges in relation to packaging, loading, unloading, carriage and insurance, all of which amounts the Buyer shall pay in addition when it is due to pay for the Goods.

7.4. In the event that the Buyer's order is to be delivered to the Buyer then the Buyer shall pay for the costs of carriage notified to the Buyer by ITC from time to time.

7.5. ITC reserves the right, by giving notice to the Buyer at any time before the delivery to increase the price for the ancillary costs to reflect any increase in the cost to ITC which is due to any factor beyond the control of ITC (such as, without limitation, any foreign exchange fluctuation, currency regulation, alteration of taxes, levies or duties, significant increase in the costs of labour, materials or other costs of manufacture, any change in delivery dates, quantities or specifications for the Goods or change to the required Services which is requested by the Buyer or any delay caused by any instructions of the Buyer or failure of the Buyer to give ITC adequate information or instructions).

8. Payment

8.1. Subject to condition 8.4, payment of the price for the Goods or the Services is (unless otherwise agreed in writing by the parties) due in pounds sterling on the last working day of the month following the month in which the Goods are delivered or deemed to be delivered. ITC reserves the right to request payment for the Goods and/or Services in advance.

8.2. Time for payment shall be of the essence.

8.3. No payment shall be deemed to have been received until ITC has received cleared funds.

8.4. All payments payable to ITC under the Contract shall become due immediately on its termination despite any other provision.

8.5. The Buyer shall make all payments due under the Contract in full without any deduction whether by way of set-off, counterclaim, discount, abatement or otherwise unless the Buyer has a valid court order requiring an amount equal to such deduction to be paid by ITC to the Buyer.

8.6. If the Buyer fails to pay ITC any sum due pursuant to the Contract, the Buyer shall be liable to pay interest to ITC on such sum from the due date for payment at the annual rate of 8% above the base lending rate from time to time of National Westminster Bank plc, accruing on a daily basis until payment is made, whether before or after judgment. ITC reserves the right to claim interest under the Late Payment of Commercial Debts (Interest) Act 1998.

9. Quality

9.1. Where ITC is not the manufacturer of the Goods, ITC shall endeavour to transfer to the Buyer the benefit of any warranty or guarantee given to ITC.

9.2. ITC warrants that:-

9.2.1. (subject to the other provisions of these conditions) on delivery that the Goods shall be of satisfactory quality within the meaning of the Sale of Goods Act 1979;

9.2.2. bought if the Buyer had made known that purpose to ITC in writing and ITC has confirmed in writing that it is reasonable for the Buyer to rely on the skill; and

9.2.3. that the Services will be provided using reasonable care and skill and, as far as reasonably possible, in accordance with the Contract and at the intervals and within the times referred to in the Contract.

9.3. The above warranty is given by ITC subject to the following conditions:

9.3.1. ITC shall be under no liability if it is established by ITC that some part of the material - used in manufacture was defective;

9.3.2. ITC shall be under no liability in respect of any defect in the Goods or Services arising from any drawing, design or specification supplied by the Buyer;

9.3.3. ITC shall be under no liability under the above warranty (or any other warranty, condition or guarantee) if the Price and all ancillary costs have not been paid by the due date for payment.

9.4. ITC shall not be liable for a breach of either of the warranties in condition 9.2 unless:

9.4.1. the Buyer gives written notice of the defect to ITC, and, if the defect is as a result of damage in transit to the carrier, within 7 days of the time when the Buyer discovers or ought to have discovered the defect; and

9.4.2. ITC is given a reasonable opportunity of receiving the notice of examining such Goods and the Buyer (if asked to do so by ITC) returns such Goods to ITC's place of business at ITC's cost for the examination to take place there.

9.5. ITC shall not be liable for a breach of either of the warranties in condition 9.2 if:

9.5.1. the Buyer makes any further use of such Goods after giving such notice; or

9.5.2. the defect arises because the Buyer failed to follow ITC's oral or written instructions as to the storage, installation, commissioning, use or maintenance of the Goods or (if there are none) good trade practice; or

9.5.3. the Buyer alters or repairs such Goods without the written consent of ITC.

9.6. Subject to condition 9.5, if any of the Goods do not conform with either of the warranties in condition 9.2 ITC shall, at its option repair or replace such Goods (or the defective part) or refund the price of such Goods at the pro rata Contract rate provided that, if ITC so requests, the Buyer shall, at ITC's expense, return the Goods or the part of such Goods which is defective to ITC.

9.7. If ITC complies with condition 9.6 it shall have no further liability for a breach of either of the warranties in condition 9.2 in respect of such Goods.

10. Limitation of liability

10.1. Subject to condition 4, condition 5 and condition 9, the following provisions set out the entire financial liability of ITC (including any liability for the acts or omissions of its employees, agents and sub-contractors) to the Buyer in respect of:

10.1.1. any breach of these conditions;

10.1.2. any use made or resale by the Buyer of any of the Goods, or of any product incorporating any of the Goods; and

10.1.3. any representation, statement or tortious act or omission including negligence arising under or in connection with the Contract.

10.2. All warranties, conditions and other terms implied by statute or common law (save for

the conditions implied by section 12 of the Sale of Goods Act 1979) are, to the fullest extent permitted by law, excluded from the Contract.

10.3. Nothing in these conditions excludes or limits the liability of ITC:

10.3.1. for death or personal injury caused by ITC's negligence; or

10.3.2. under section 2(3), Consumer Protection Act 1987; or

10.3.3. for any matter which it would be illegal for ITC to exclude or attempt to exclude its liability; or

10.3.4. for fraud or fraudulent misrepresentation.

10.4. Subject to condition 10.2 and condition 10.3:

10.4.1. ITC's total liability in contract, tort (including negligence or breach of statutory duty), misrepresentation, restitution or otherwise, arising in connection with the performance or contemplated performance of the Contract shall be limited to the contract price; and

10.4.2. ITC shall not be liable to the Buyer for loss of profit, loss of business, or depletion of goodwill in each case whether direct, indirect or consequential, or any claims for consequential compensation whatsoever (howsoever caused) which arise out of or in connection with the Contract.

11. Export terms

11.1. Unless the context otherwise requires, any term or expression which is defined in or given a particular meaning by the provisions of INCOTERMS shall have the same meaning in these Conditions, but if there is any conflict between the provisions of INCOTERMS and these Conditions, the latter shall prevail.

11.2. Where the Goods are supplied for export from the United Kingdom, the provisions of this clause 11 shall (subject to any special terms agreed in writing between the Buyer and ITC) apply notwithstanding any other provision of these Conditions.

11.3. The Buyer shall be responsible for complying with any legislation or regulations governing the export of the Goods into the country of destination and for the payment of any duties on them.

11.4. Unless otherwise agreed in writing between the Buyer and ITC, the Goods shall be delivered (by air or sea port of shipment) and the Seller shall be under no obligation to give notice under section 32(3) of the Sale of Goods Act 1979.

11.5. The Buyer shall be responsible for arranging for testing and inspection of the Goods at ITC's premises before shipment. ITC shall have no liability for any claim in respect of any defect in the Goods which would be apparent on inspection and which is made after shipment, or in respect of any damage during transit.

11.6. Unless otherwise required by ITC, payment of all amounts due to the Seller shall be made by an irrevocable letter of credit, in a form acceptable to ITC, to be opened by the Buyer in favour of ITC and confirmed by a bank in the United Kingdom acceptable to ITC within 14 days after the Contract is concluded.

11.7. The Buyer shall not offer the Goods for resale in, or any other country notified by ITC to the Buyer at or before the time the Buyer's order is placed, or sell the Goods to any person if the Buyer knows or has reason to believe that that person intends to resell the Goods in any such country.

12. Assignment

12.1. ITC may assign the Contract or any part of it to any person, firm or company.

12.2. The Buyer shall not be entitled to assign the Contract or any part of it without the prior written consent of ITC.

13. Force majeure

13.1. ITC reserves the right to defer the date of delivery or performance or to cancel the Contract or reduce the volume of the Goods ordered by the Buyer (without liability to the Buyer) if it is prevented from or delayed in the carrying on of its business due to circumstances beyond the reasonable control of ITC including, without limitation, acts of God, governmental actions, war or national emergency, acts of terrorism, protests, riot, civil commotion, fire, explosion, flood, epidemic, lock-outs, strikes or other labour disputes (whether or not relating to their service's workforce), or restraints or delays affecting carriers or liability or delay in obtaining supplies of adequate or suitable materials, provided that, if the event in question continues for a continuous period in excess of 90 days, the Buyer shall be entitled to give notice in writing to ITC to terminate the Contract.

14. General

14.1. Each right or remedy of ITC under the Contract is without prejudice to any other right or remedy of ITC whether under the Contract or not.

14.2. If any provision of the Contract is found by any court, tribunal or administrative body of competent jurisdiction to be wholly or partly illegal, invalid, void, voidable, unenforceable or unreasonable it shall to the extent of such illegality, invalidity, voidness, voidability or unenforceability or unreasonableness be deemed severable and the remaining provisions of the Contract and the remainder of such provision shall continue in full force and effect.

14.3. Failure or delay by ITC in enforcing or partially enforcing any provision of the Contract shall not be construed as a waiver of any of its rights under the Contract.

14.4. Any waiver by ITC of any breach of, or any default under, any provision of the Contract by the Buyer shall not be deemed a waiver of any subsequent breach or default and shall in no way affect the other terms of the Contract.

14.5. The parties to the Contract do not intend that any term of the Contract shall be enforceable by virtue of the Contracts (Rights of Third Parties) Act 1999 by any person that is not a party to it.

14.6. The formation, existence, construction, performance, validity and all aspects of the Contract shall be governed by English law and the parties submit to the exclusive jurisdiction of the English courts.

15. Communications

15.1. All notices sent between the parties relating to the Contract shall be in writing and delivered by hand or sent by pre-paid first class post or sent by fax:

15.1.1. (in case of notices to ITC) to its registered office or such changed address as shall be notified to the Buyer by ITC; or

15.1.2. (in the case of notices to the Buyer) to the registered office of the addressee (if it is a company) or (in any other case) to any address of the Buyer set out in any document which forms part of the Contract or such other address as shall be notified to ITC by the Buyer.

15.2. Notices shall be deemed to have been received:

15.2.1. if sent by pre-paid first class post, two days (excluding Saturdays, Sundays and bank and public holidays) after posting (exclusive of the day of posting); or

15.2.2. if delivered by hand, on the day of delivery; or

15.2.3. if sent by fax on a working day prior to 4.00 pm, at the time of transmission and otherwise on the next working day.

15.3. Notices addressed to ITC shall be marked for the attention of Mr P Graves.

16. Indemnity

16.1. If any claim is made against the Buyer that the Goods or Services provided infringe or that their use or resale infringe the patent, copyright, design, trade mark or other industrial or intellectual property rights of any other person, then unless the claim arises from the use of any drawing, design or specification supplied by the Buyer, ITC shall indemnify the Buyer against all loss, damages, costs and expenses awarded against or incurred by the Buyer in connection with the claim, or paid or agreed to be paid by the Buyer in settlement of the claim, provided that:

16.1.1. the Buyer shall immediately inform ITC of all such claims;

16.1.2. ITC is given full control of any proceedings or negotiations in connection with any such claim;

16.1.3. the Buyer shall give ITC all reasonable assistance for the purposes of any such proceedings or negotiations;

16.1.4. except pursuant to a final award, the Buyer shall not pay or accept any such claim, or compromise any such proceedings without the consent of ITC (which shall not be unreasonably withheld);

16.1.5. the Buyer shall do nothing which would or might vitiate any policy of insurance or insurance cover which the Buyer may have in relation to such infringement, and this indemnity shall not apply to the extent that the Buyer recovers any sums under any such policy or cover (which the Buyer shall use its best endeavours to do);

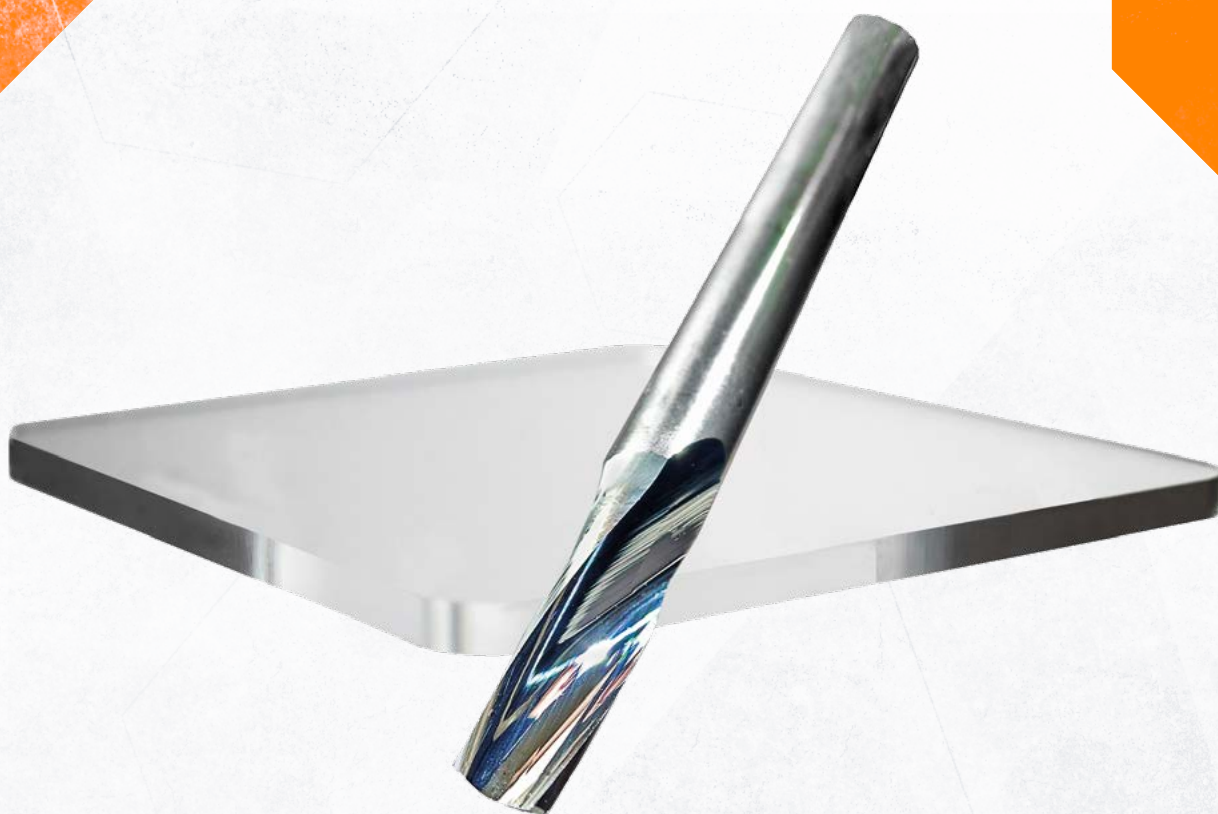
16.1.6. ITC shall be entitled to the benefit of, and the Buyer shall accordingly account to ITC for, all damages and costs (if any) awarded in favour of the Buyer which are payable by, or agreed with the consent of the Buyer (which consent shall not be unreasonably withheld) to be paid by, any other party in respect of any such claim; and

16.1.7. without prejudice to any duty of the Buyer at common law, ITC shall be entitled to require the Buyer to take such steps as ITC may reasonably require to mitigate or reduce any such loss, damages, costs or expenses for which ITC is liable to indemnify the Buyer under this clause.

17. Insolvency of Buyer

17.1. This clause applies if:

17.1.1. the Buyer makes any voluntary arrangement with its creditors or (being an individual or firm) becomes bankrupt or (being a company) becomes subject to an administration order or goes into liquidation (otherwise than for the purposes of amalgamation or reconstruction); or



Industrial Tooling Corporation Ltd
Cyber House, 1 Kepler
Lichfield Road Industrial Estate
Tamworth, Staffordshire B79 7XE UK

 **+44 (0)1827 304500**

 **sales@itc-ltd.co.uk**

 **www.itc-ltd.co.uk**

 **/industrialtoolingcorporation**

 **/itc_tooling**

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