

MASTER<sup>®</sup>

# Tungsten Carbide Rotary Burrs

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SOLUTIONS FOR INDUSTRY



## Introduction

### Master Abrasives

The **MASTER®** brand is known internationally as a high-quality brand of abrasives, tools and consumables by Master Abrasives, accredited to ISO 9001 standards. As an independent UK owned company with over 50 years' experience in the abrasives market, we supply industry with high performance tungsten carbide burrs.

We aim to provide solutions for industry through both our products and professional service. Master burrs are manufactured with precision to provide high stock removal rates and long life. Our technical application team works with customers worldwide to find solutions for applications and help to achieve improved productivity with high quality, cost-effective products.

Our comprehensive range of burr shapes, sizes and fluting styles ensures we can offer a tool that meets the most demanding application.



### Applications

Due to the nature of tungsten carbide and its extreme hardness, the range of applications and uses for carbide burrs is extensive.

The automotive, aircraft, precision engineering and foundry industries are typical users and applications include the machining of:

- Aluminium, plastic
- Brass, copper, cast iron, bronze
- Unhardened steel
- Hardened steels, stainless steels, nimonic alloys, titanium.





# Cut Types

The Master range of cut styles has been developed over years of application experience, with single, double, coarse, diamond, and ripper (Aluminium) cut being offered. We can also develop specifically modified cuts to suit specific and tough applications.

## Cut Selection Guide

| Material  | Cut Type   |            |            |             |            |
|---|------------|------------|------------|-------------|------------|
|   | Single Cut | Double Cut | Coarse Cut | Diamond Cut | Ripper Cut |
| Aluminium, Plastic  |            |            |            |             | X          |
| Brass, Copper, Cast Iron, Bronze                            | X          | X          | X          | X           |            |
| Unhardened Steel  |            |            | X          |             |            |
| Hardened Steels, Stainless Steels, Nimonic Alloys, Titanium | X          | X          |            | X           |            |
| Fibreglass  |            |            |            | X           |            |

### MASTER® Single Cut

General purpose cut suitable for use on stainless steel, hardened steel, cast iron and weld preparation.



### MASTER® Double Cut

Allows fast stock removal and increases production rates. Effectively reduces chips as the material is removed, resulting in improved control and a smoother running burr. Recommended for working on materials which produce long chips, such as soft steels and cast iron welds.



### MASTER® Coarse Cut

Available in double or single coarse cut. Suitable for stock removal and finishing on non-ferrous metals such as brass, copper and zinc.



### MASTER® Diamond Cut

The staggered tooth geometry provides more cutting edges which result in greater material penetration of heat treated steels and tough alloy steels. Provides faster metal removal and smoother cutting action with improved control.



### MASTER® Ripper Cut

Free and fast-cutting for rapid stock removal on non-ferrous materials, including aluminium, soft steels and reinforced plastics. Produces a good finish with minimum tooth loading.





## Cylinder Without End Cut

| Ref. No.          | A0150603 | A0251103 | A031403 | A041606 | A061203 | A061606 | A081906 | A102006 | A122506 | A162506 |
|-------------------|----------|----------|---------|---------|---------|---------|---------|---------|---------|---------|
| Head- Ø mm        | 1.5      | 2.5      | 3       | 4       | 6       | 6       | 8       | 10      | 12      | 16      |
| Head- Length mm   | 6        | 11       | 14      | 16      | 12      | 16      | 19      | 20      | 25      | 25      |
| Shank- Ø mm       | 3        | 3        | 3       | 6       | 3       | 6       | 6       | 6       | 6       | 6       |
| Overall length mm | 38       | 38       | 38      | 50      | 50      | 50      | 63      | 60      | 65      | 69      |



## Cylinder With End Cut

| Ref. No.          | B0150603 | B0251103 | B031403 | B041606 | B060503 | B061606 | B081906 | B102006 | B122506 | B162506 |
|-------------------|----------|----------|---------|---------|---------|---------|---------|---------|---------|---------|
| Head- Ø mm        | 1.5      | 2.5      | 3       | 4       | 6       | 6       | 8       | 10      | 12      | 16      |
| Head- Length mm   | 6        | 11       | 14      | 16      | 5       | 16      | 19      | 20      | 25      | 25      |
| Shank- Ø mm       | 3        | 3        | 3       | 6       | 3       | 6       | 6       | 6       | 6       | 6       |
| Overall length mm | 38       | 38       | 38      | 50      | 50      | 50      | 63      | 60      | 65      | 69      |



## Cylindrical Ball Nose

| Ref. No.          | C0251103 | C031403 | C041203 | C041606 | C061203 | C061606 | C081906 | C102006 | C122506 | C162506 |
|-------------------|----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Head- Ø mm        | 2.5      | 3       | 4       | 4       | 6       | 6       | 8       | 10      | 12      | 16      |
| Head- Length mm   | 11       | 14      | 12      | 16      | 12      | 16      | 19      | 20      | 25      | 25      |
| Shank- Ø mm       | 3        | 3       | 3       | 6       | 3       | 6       | 6       | 6       | 6       | 6       |
| Overall length mm | 38       | 38      | 38      | 50      | 50      | 50      | 63      | 60      | 65      | 69      |



## Ball Nose

| Ref. No.          | D01501503 | D030303 | D040403 | D050503 | D060603 | D060606 | D080806 | D101006 | D121206 | D161606 |
|-------------------|-----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Head- Ø mm        | 1.5       | 3       | 4       | 5       | 6       | 6       | 8       | 10      | 12      | 16      |
| Head- Length mm   | 1.5       | 2.8     | 3.4     | 4       | 5       | 4.7     | 6       | 9       | 11      | 14      |
| Shank- Ø mm       | 3         | 3       | 3       | 3       | 3       | 6       | 6       | 6       | 6       | 6       |
| Overall length mm | 60        | 38      | 38      | 38      | 44      | 50      | 50      | 49      | 51      | 58      |



## Oval

| Ref. No.          | E030603 | E060903 | E101606 | E122206 | E162506 | E192506 |
|-------------------|---------|---------|---------|---------|---------|---------|
| Head- Ø mm        | 3       | 6       | 10      | 12      | 16      | 19      |
| Head- Length mm   | 6       | 9       | 16      | 22      | 25      | 25      |
| Shank- Ø mm       | 3       | 3       | 6       | 6       | 6       | 6       |
| Overall length mm | 38      | 47      | 60      | 66      | 69      | 69      |



## Ball Nose Tree

| Ref. No.          | F031203 | F061203 | F061606 | F101906 | F122506 | F162506 |
|-------------------|---------|---------|---------|---------|---------|---------|
| Head- Ø mm        | 3       | 6       | 6       | 10      | 12      | 16      |
| Head- Length mm   | 12      | 12      | 16      | 19      | 25      | 25      |
| Shank- Ø mm       | 3       | 3       | 6       | 6       | 6       | 6       |
| Overall length mm | 38      | 56      | 50      | 63      | 65      | 69      |



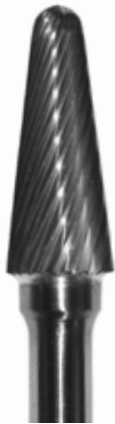
## Pointed Tree

| Ref. No.          | G030603 | G031203 | G061203 | G061606 | G081906 | G102006 | G122006 | G122506 | G162506 |
|-------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Head- Ø mm        | 3       | 3       | 6       | 6       | 8       | 10      | 12      | 12      | 16      |
| Head- Length mm   | 6       | 12      | 12      | 16      | 19      | 20      | 20      | 25      | 25      |
| Shank- Ø mm       | 3       | 3       | 3       | 6       | 6       | 6       | 6       | 6       | 6       |
| Overall length mm | 38      | 38      | 50      | 50      | 63      | 60      | 63      | 65      | 69      |



## Flame Shape

| Ref. No.          | H030603 | H051003 | H081906 | H123206 | H163606 |
|-------------------|---------|---------|---------|---------|---------|
| Head- Ø mm        | 3       | 5       | 8       | 12      | 16      |
| Head- Length mm   | 6       | 10      | 19      | 32      | 36      |
| Shank- Ø mm       | 3       | 3       | 6       | 6       | 6       |
| Overall length mm | 38      | 38      | 63      | 76      | 80      |



## Ball Nose Cone

| Ref. No.          | L031003 | L031203 | L061606 | L082206 | L102706 | L122806 | L163006 |
|-------------------|---------|---------|---------|---------|---------|---------|---------|
| Head- Ø mm        | 3       | 3       | 6       | 8       | 10      | 12      | 16      |
| Head- Length mm   | 10      | 12      | 16      | 22      | 27      | 28      | 30      |
| Shank- Ø mm       | 3       | 3       | 6       | 6       | 6       | 6       | 6       |
| Overall length mm | 38      | 38      | 50      | 69      | 74      | 76      | 77      |



## Cone Included Angle

12° 14° 7° 22° 14° 28° 28° 31°

| Ref. No.          | M030903 | M031203 | M031603 | M061203 | M061906 | M101606 | M122206 | M162506 |
|-------------------|---------|---------|---------|---------|---------|---------|---------|---------|
| Head- Ø mm        | 3       | 3       | 3       | 6       | 6       | 10      | 12      | 16      |
| Head- Length mm   | 9       | 12      | 16      | 12      | 19      | 16      | 22      | 25      |
| Shank- Ø mm       | 3       | 3       | 3       | 3       | 6       | 6       | 6       | 6       |
| Overall length mm | 38      | 38      | 38      | 53      | 50      | 63      | 69      | 73      |

## Cone 60°

| Ref. No.          | M121106-60 | M161506-60 | M191806-60 |
|-------------------|------------|------------|------------|
| Head- Ø mm        | 12         | 16         | 19         |
| Head- Length mm   | 11         | 15         | 18         |
| Shank- Ø mm       | 6          | 6          | 6          |
| Overall length mm | 58         | 61         | 65         |

## Cone 90°

| Ref. No.          | M120606-90 | M160806-90 | M191006-90 |
|-------------------|------------|------------|------------|
| Head- Ø mm        | 12         | 16         | 19         |
| Head- Length mm   | 6          | 8          | 10         |
| Shank- Ø mm       | 6          | 6          | 6          |
| Overall length mm | 54         | 57         | 58         |



## Inverted Cone

| Ref. No.          | N030403 | N060603 | N060806 | N101006 | N121206 |
|-------------------|---------|---------|---------|---------|---------|
| Head- Ø mm        | 3       | 6       | 6       | 10      | 12      |
| Head- Length mm   | 4       | 6       | 8       | 10      | 12      |
| Shank- Ø mm       | 3       | 3       | 6       | 6       | 6       |
| Overall length mm | 38      | 44      | 50      | 53      | 57      |

# Specials

At Master Abrasives we offer to work with you to find the solution to your application problems. Our team of technical representatives work with you to achieve improved productivity with high quality, cost-effective products. This can be through the application of one of our standard stock items or when required our team will work at developing a special design specifically to suit your application, for example a Chip Breaker Cut.

Our manufacturing team then set to work on developing the most cost-efficient production method on our state of the art machinery to produce your burrs, the result being the most productive and cost-efficient burr for your application.

## Long and Double-Ended Shank Burrs

Within our extensive range we also offer a selection of Master burrs with long shanks to allow access to hard-to-reach areas and solve long reach application problems.

Master can also supply a comprehensive range of double ended burrs to further aid in productivity and cost savings for our customers.

## Coatings

A range of wear coatings, such as titanium nitride, is available to improve burr life and to suit demanding applications.

# Tungsten Carbide Burr Kits

Master carbide burr kits offer a selection of shapes for a variety of applications, including general purpose deburring. These kits are extremely popular with toolmakers, maintenance engineers and are an ideal addition to any comprehensive tool kit.

## 6mm shank kit

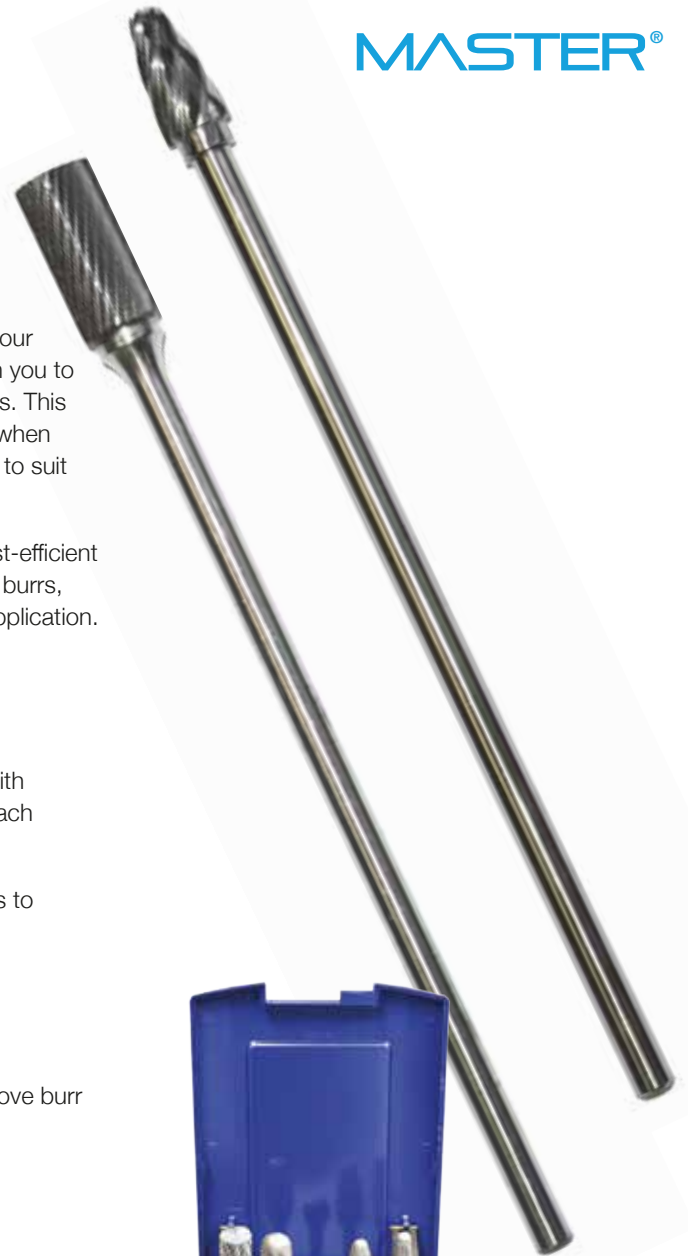
### 5 piece set of 6mm shank burrs in double cut

B122506 DC, C122506 DC, D121206 DC, F122506 DC and L122806 DC.

## 3mm shank kit

### 10 piece set of 3mm shank burrs in double cut

A031403 DC, B031403 DC, C031403 DC, D030303 DC, E030603 DC, F031203 DC, G031203 DC, H030603 DC, L031003 DC and M031203 DC.



## Running Speed Guide - approx. R.P.M. in 1000s

| Head Dia.   | 1/8"  | 5/32" | 1/4"  | 5/16" | 3/8"  | 1/2"  | 5/8"  | 1"   |
|---|-------|-------|-------|-------|-------|-------|-------|------|
| Materials   | 3mm   | 4mm   | 6mm   | 8mm   | 10mm  | 13mm  | 16mm  | 25mm |
| Alum, Zinc Base, Plastics                                 | 20-90 | 10-60 | 10-50 | 10-50 | 10-40 | 10-30 | 8-20  |      |
| Cast Iron, Brass, Copper                                  | 40-90 | 20-50 | 20-50 | 15-40 | 10-30 | 10-25 | 10-20 |      |
| Glass Fibre   | 40-90 | 30-50 | 20-30 | 15-20 | 15-20 | 10-15 | 8-10  | 5-8  |
| Mild Steel, Bronze  | 60-90 | 50-80 | 30-40 | 25-40 | 20-30 | 15-20 | 10-15 | 8-10 |
| Nimonic, Titanium, Stainless<br>Hardened Steels, Ceramics | 40-80 | 30-60 | 25-50 | 20-40 | 15-30 | 10-20 | 8-15  |      |

**Note:** Coarse teeth burrs should be run faster than fine teeth burrs.  
Long shank burrs should be used at lower running speeds.

## How to Order



C 12 25 06 DC

|                                     |                             |                           |                              |                            |   |
|-------------------------------------|-----------------------------|---------------------------|------------------------------|----------------------------|---|
| Shape<br>Cylindrical<br>Ball Nose C | Head Diameter<br>(mm)<br>12 | Head Length<br>(mm)<br>25 | Shank<br>Diameter (mm)<br>06 | Cut Style<br>Double Cut DC | Optional<br>Features e.g.,<br>Long Shank,<br>Double Ended |
|-------------------------------------|-----------------------------|---------------------------|------------------------------|----------------------------|---|



# The right tool for the job

At Master Abrasives, we recommend that you use the right tool to get the most efficient use from your carbide burrs, reducing production costs and minimising risks from Hand Arm Vibration. As distributors for a range of high quality pneumatic and electric tool brands, we are happy to advise in the selection of the best tool for your application.



## Pencil Grinder Miniature Precision Tool

**ZPD212** ..... Micro Air Die Grinder 0.12HP  
Rear exhaust, 60,000 RPM high speed for fine deburring  
For use with 3mm or 1/8" accessories



## Right Angle Grinder

**ZDG-236** ..... Mini Air Angle Die Grinder 20,000 RPM for general purpose stock removal  
**ZP319**..... Air Angle Die Grinder 18,000 RPM for general purpose stock removal  
**ZDG-302** ..... Air Angle Die Grinder 18,000 RPM 0.9HP  
**ZDG-3226** .... Air Angle Die Grinder (115°)



## Extension Grinder

**ZP315**..... 5" Extended Air Die Grinder 22,000 RPM  
**ZP314**..... 3" Extended Air Die Grinder 22,000 RPM  
**ZDG-301AL**.. 3 1/2" Extended Air Die Grinder 22,000 RPM 1HP  
**ZDG-301L** .... 5 1/2" Extended Air Die Grinder 22,000 RPM 1HP



## Inline Grinder

**ZP313**..... Air Die Grinder 22,000 RPM  
**ZDG-231** ..... Mini Air Die Grinder 25,000 RPM  
**ZDG-301** ..... Air Die Grinder 23,000 RPM 0.9HP  
**ZDG-S216**.... Air Die Grinder 15,000 RPM  
**ZDG-376A**.... Air Die Grinder 3,600 RPM

## Information

### Operator

- The standard tooth pitch on a Master tungsten carbide burr will suit almost all operations on any material as long as the burr is run at the correct speed.
- Apply constant movement and light pressure when in use. Remove high spots first and then traverse the work. Excessive pressure should not be applied as this can cause impact damage to the burr especially on very hard materials or irregular shapes.
- A cutter should never be allowed to lock, or wedge, in the workpiece profiles or cavities since this will certainly result in shattered teeth and/or a broken shank.
- Check that the collet is the correct size and not worn or eccentric. The cutter must run true. Rotational eccentricity produces a type of hammering that will affect the finish of the work and jeopardise the life of the teeth and the shank.
- The workpiece should be securely held in either a vice, or a jig, so that it cannot move whilst cutting.
- If the teeth of a cutter tend to get clogged (i.e. when cutting aluminium, brass etc.) they should be cleared periodically by cutting into a spare piece of soft cast iron. Also the occasional application of tallow is helpful.

### Safety

- Always wear ear, eye and face protection as well as protective safety gloves.
- Follow the running speed guide on page 8
- Long shank burrs should be used at lower running speeds.
- Select the correct shape, size and cut for the job.
- Use the appropriate tool and ensure that it is regularly maintained.
- Insert the shank well down in the collet, but not as far as the radiused shoulder below the head.
- Don't use low running speeds for burrs, this can cause tooth loading and chipping.



# Enquiry form

Company: .....

Address: .....

Contact name: .....

Contact info: .....

| APPLICATION                    |  |
|--------------------------------|--|
| Application type               |  |
| Stock removal (light or heavy) |  |
| Component type                 |  |
| Component material             |  |
| PRODUCT                        |  |
| Current product/brand          |  |
| Master product details         |  |
| Master product code            |  |
| POWER TOOL                     |  |
| Tool brand and model           |  |
| Condition                      |  |
| Date of last service           |  |
| Speed RPM                      |  |
| Suitable power/air supply      |  |
| OPERATOR                       |  |
| Name                           |  |
| Experience                     |  |

Send us a copy of the above form completed to arrange your Master carbide burr trial.



Aerospace

Tooling

Fabrication

Power  
Generation

Medical

Heavy  
Engineering

Automotive

Bearing

Oil & Gas

Woodwork

## SOLUTIONS FOR INDUSTRY

For further information on Master products and services or technical applications support, please contact us

**MASTER**  
**ABRASIVES**



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