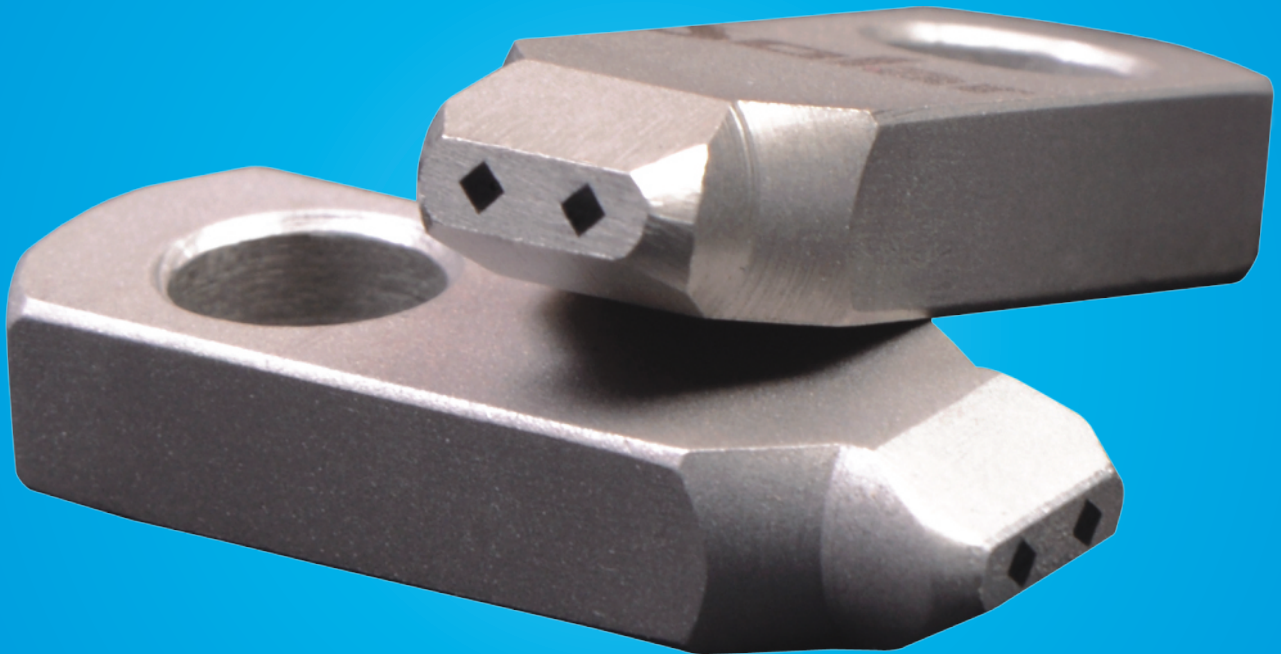


Solar
DIAMOND

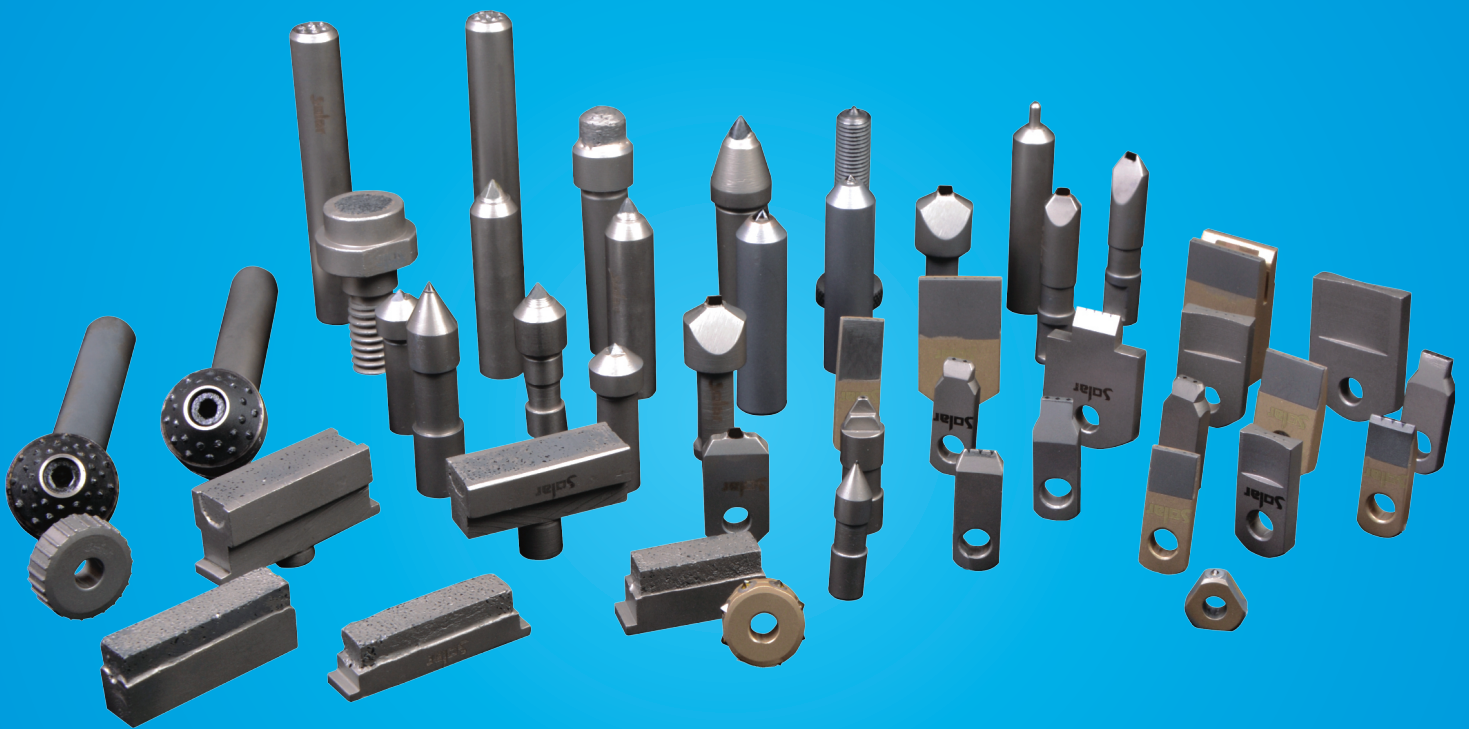
DIAMOND ENGINEERING



Volume III

**Stationery Diamond Dressers
Technical Manual**

DIAMOND ENGINEERING



SOLAR DIAMOND TOOLS (INDIA) PVT. LTD.

Introduction

VERTICAL LIMIT

This is a unique concept created by our team. This concept enhances and sets parameter for quality. This Basic concept is to cross the limit of common barriers in quality.

Innovations and constant upgradation is our ambition.

At the outset, advanced, high-performance grinding technology is vital to manufacturing industry today.

The demands on the grinding process are becoming ever tougher, both in economics and in dimensional and geometrical tolerances and surface quality.

This is where dressing steps in.

Dressing tools for silicon carbide and aluminium oxide wheels must fulfill the following tasks:

1. "True" the wheel to eliminate run-out and correct geometrical shape.
2. Restore the required effective roughness of the wheel.
3. Keep the wheel 'open' for high grinding efficiency.

The dressing process exposes a new sharp cutting layer on the wheel. The dressing tool is clamped and guided by the machine, and relative dresser / wheel movements (infeed and transverse feed) are executed by the dressing tool or the wheel. The path followed by the dressing tool determines the geometry of the grinding wheel.

The diamond's superlative hardness and wear resistance, makes it the ideal material for dressing tools.

The scope of this catalogue is to discuss diamond dressing tools. The catalogue encompasses, in detail, the technology of these tools. It will facilitate in the proper selection and ordering, as well as in the economical application of these tools.

We have the capability of manufacturing custom dressing tools to customer's specifications. Extensive emphasis is placed on "multi point" dressing tools because these dressing tools in recent years have become increasingly tool of choice.



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Application of diamond dressing tools

Technical advice ☐

Quotation ☐

Ordering ☐

Complaint ☐

Customer: Name:

Address:

Name of Person:

Designation:

Weekly off:

Phone No.:

Fax No.:

Mobile:

Email:

Please let us have detailed information on your machining problem.

1. Grinding wheel to be dressed: 1.1 Dimensions :

(Outer diameter x width x hole diameter)

1.2 Specification :

(Abrasive / grain size / hardness / structure/bond))

1.3 Manufacturer :

2. Machine:

2.1 Manufacturer :

2.2 Model:

2.3 Grinding Method :

3. Dressing Method:

3.1 Plain Dressing :

at the periphery ☐

on the face ☐

3.2 Profile forming and dressing :

inclined in-feed ☐

straight in-feed ☐

4. Workpiece:

4.1 Name of workpiece :

4.2 Workpiece material :

4.3 Hardness :

4.4 Surface finish required :

5. Diamond Dresser:

5.1 Insert, shank of

holder dimensions :

5.2 Minimum mounting height ("L")

5.3 Type of Tool used at present

Note : Take photo copy of this page.

Sign : of the person :

Single Point Diamond Dressers

Natural and Bruted Point

Single point "bruted diamond" dressers are made with selected "Congo Rounds" mounted in a matrix. A Single cutting edge is presented to the grinding wheel.

Diamonds for single point dressers are selected in accordance with quality and size. The question of using a superior, average or commercial quality, depends on the grinding finish required and the machines and working parameters.

We offer three grades namely A, B & C for all the diamond size, Availability: 0.25 Ct to 5.00 Ct

Natural Point Diamonds: The Diamond points are naturally formed. (Not made like grades A, B & C) This is a gift of nature. Natural Point Diamond Dressers have high form retention properties. Availability: 0.10 Ct to 2.50 Ct

Guideline for single-point diamond dressers:

Considerable care should be taken in mounting the diamond dresser in position. Diamonds are sensitive to shock and impact.

The dresser must be clamped rigidly in place to avoid vibration once dressing begins.

An ample supply of coolant should be directed at the diamond point before dressing begins, as the sudden application of coolant to the diamond once it has heated up can cause it to shatter.

The diamond holder should not be set directly on the center of the grinding wheel, but at an angle of 5-15 to the direction of rotation of the wheel so that it appears to be "trailing"

At normal wheel peripheral speeds, dressing rates of approximately 20-25 m/sec can be achieved.

The maximum depth of cut achieved per dressing pass is 0.03 mm or on fine grit wheels, approximately 0.005-0.01 mm,

The cross feed rate is dependent upon grit size and can have a marked influence on the quality of the finish imparted to the grinding wheel surface. The lower the feed rate, the finer the surface finish. We would recommend the following feed rates per revolution of the grinding wheel.

Grinding wheel grit size	Feed rate in mm/rev
30 - 46	0.60 - 0.30
50 120	0.30 0.10
180 320	0.10 0.02

Single Point Diamond Dressers

Natural and Bruted Point



Standards shanks 1/2" x 6" upto 2.50 cts. Standards shanks 5/8" x 6" over 2.50 cts. Shanks are also fabricated according to your blue prints. While ordering specify grade & ct. wt.

CT. SIZE	GRADE AVAILABLE								DIMENSIONS
	NP AAA	NP	NPLZ	NPBT	BTLZ	A	B	C	
0.25	☒	☒	☒	☒	☒	☒	☒	☒	Style A
0.35	☒	☒	☒	☒	☒	☒	☒	☒	
0.50	☒	☒	☒	☒	☒	☒	☒	☒	
0.75	☒	☒	☒	☒	☒	☒	☒	☒	
1.00	☒	☒	☒	☒	☒	☒	☒	☒	Style B
1.50	☒	☒	☒	☒	☒	☒	☒	☒	
2.00	☒	☒	☒	☒	☒	☒	☒	☒	
2.50	☒	☒	☒	☒	☒	☒	☒	☒	
3.00	☐	☐	☐	☐	☐	☒	☒	☒	MT 1
3.50	☐	☐	☐	☐	☐	☒	☒	☒	
4.00	☐	☐	☐	☐	☐	☒	☒	☒	
4.50	☐	☐	☐	☐	☐	☒	☒	☒	
5.00	☐	☐	☐	☐	☐	☒	☒	☒	

Other shank dimensions available on request.

All dimensions in mm

Throw-Away Diamond Dressers

Throw-away type diamond dressers are made of small selected crystal shape or octahedral diamonds, mounted in a matrix. Only one cutting edge is presented to the grinding wheel.

Diamonds for throw-away type diamond dressers are selected for their structural strength, degree of sharpness and lack of detrimental flaws. The proper selection of size and quality appropriate for a given application requires qualified and experienced judgement.

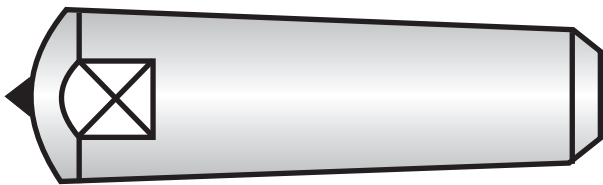
As the name suggests is really a throw - away dresser that means no maintenance, no re-setting of diamond required.

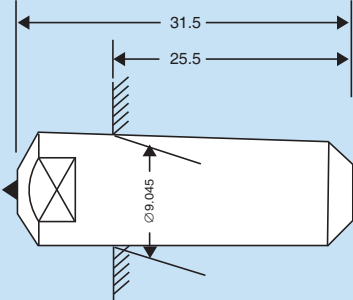
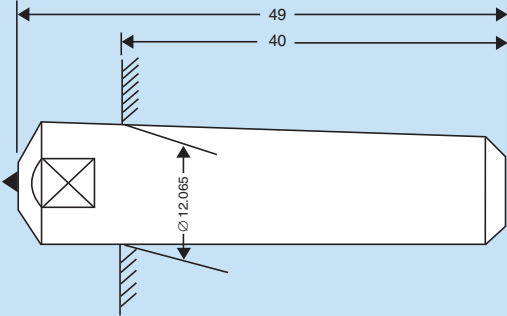
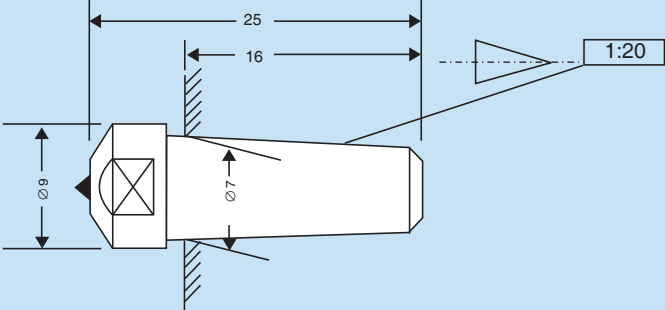
They are used for truing and dressing small and medium sized wheels. For larger wheels with small widths they are used only in profile dressing applications.

These tools are not suited to dress wheels with grit size coarser than 60 mesh.

For your reference we have given few of the standard tools as per European & American specifications, however it can be manufactured as per your specifications.

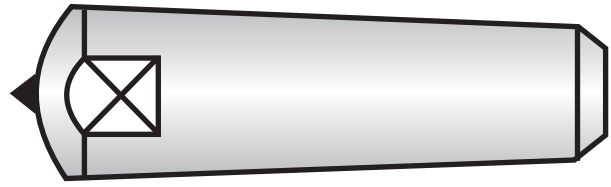
Throw-Away Diamond Dressers



NO.	SIZE	CT. WT.	DIMENSIONS
1	MT-0	0.05	
		0.07	
		0.10	
		0.15	
		0.20	
		0.25	
1	MT-1	0.05	
		0.07	
		0.10	
		0.15	
		0.20	
		0.25	
1	1:20 Taper	0.05	
		0.07	
		0.10	
		0.15	
		0.20	
		0.25	

Other shank dimensions available on request.
All dimensions in mm

Throw-Away Diamond Dressers

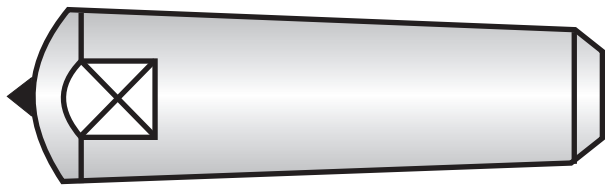


NO.	SIZE	CT. WT.	DIMENSIONS
4	1:13:15	0.08	
		0.10	
		0.15	
		0.20	
5	Voumard	0.05	
		0.08	
		0.10	
		0.15	
6	4x20 mm	0.05	
		0.08	
7	6x25	0.05	
		0.08	
		0.10	
8	8x27mm	0.05	
		0.10	
		0.15	
		0.20	
9	8x30mm	0.05	
		0.08	
		0.10	

Other shank dimensions available on request.

All dimensions in mm

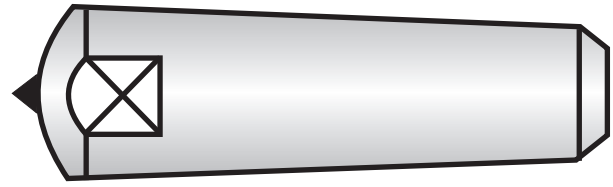
Throw-Away Diamond Dressers

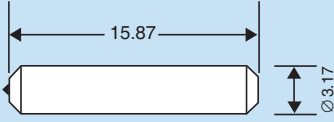
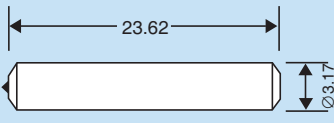
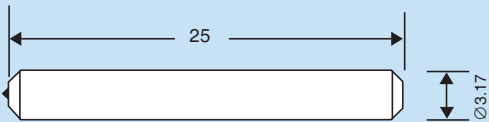
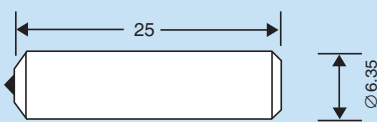
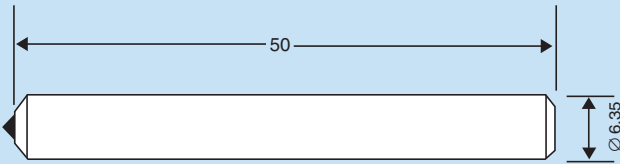
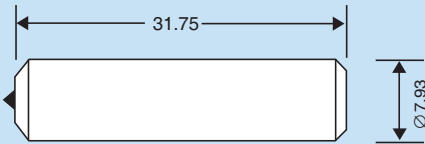
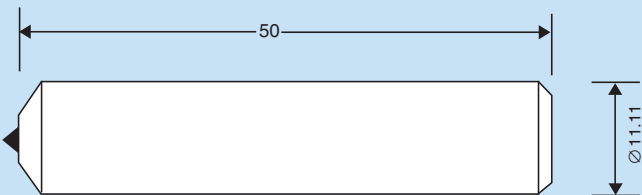


NO.	SIZE	CT. WT.	DIMENSIONS
10	8x35mm	0.05 0.08 0.10	
11	10x30mm	0.05 0.08 0.10	
12	11x30mm	0.05 0.08 0.10	
13	14x40mm	0.05 0.08 0.10	
14	48-4105	0.05	

Other shank dimensions available on request.
All dimensions in mm

Throw-Away Diamond Dressers

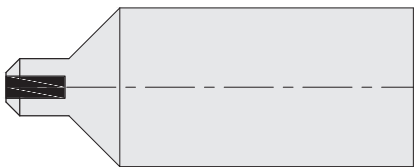


NO.	SIZE	CT. WT.	DIMENSIONS
15	3.17x15.87	0.03	
16	3.17x23.62	0.03	
17	3.17x25	0.03	
18	6.35x25	0.05	
19	6.35x50	0.05	
20	7.93x31.75	0.05 0.08 0.10	
21	11.11x50	0.05 0.08 0.10	

Other shank dimensions available on request.

All dimensions in mm

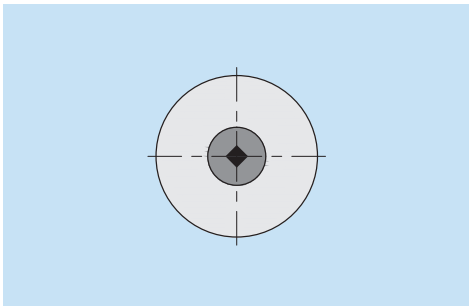
Single Point MCD Dressers



The single point dresser is made of synthetic diamond (CVD or MCD) or a natural diamond, preferably an octahedron. The hard material is gripped in a mount that is suitable for the machine toolholder and direction of use. Diamonds of many different grades and dimensions are used depending on the customer's requests and the application. The main applications for these dressers are small single-profile grinding wheels and internal cylindrical grinding. An exception to this is the profile diamond with a pre-ground radius and angle, which is also used for larger grinding wheels and wheels with complex profiles. Care is required when using these individual dressing tools, as the exposed hard diamond tips are susceptible to vibration and impacts as well as large variations in temperature, which can cause damage to the tool.

Single Point Dressers with MCD needles

This single point dresser consists of a synthetic MCD needle gripped in a holder. The advantage of the synthetic diamond over the natural one is that its precise geometry remains constant over the whole of its working life. This guarantees a uniformly high surface finish that can be reproduced every time without the need to change any set variables such as feed. It is therefore highly suitable for CNC dressing processes and the machining of small grinding wheels, including profiled ones, and internal cylindrical grinding. There is a cutout in the head of the dresser to make it easier to position the needle correctly with respect to the grinding wheel when setting up. The MCD needle is sintered in diagonally with respect to the cutout as this guarantees the longest possible tool life. The cutout must therefore be at right angles to the grinding wheel to obtain the maximum benefit.



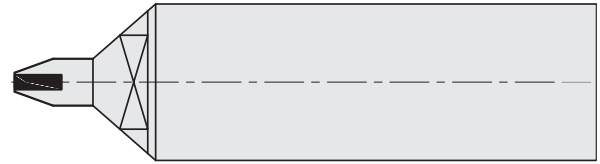
Standard range of single point dressers with MCD needles

Needle Dimensions			Shank Type
D	T	L	
0.6	0.8	4	MT0
0.6	0.8	4	MT1
0.6	0.8	4	Ø10 x 50
0.8	1.1	4	MT0
0.8	1.1	4	MT1
0.8	1.1	4	Ø10 x 50
1.15	1.5	4	MT0
1.15	1.5	4	MT1
1.15	1.5	4	Ø10 x 50

Other shank dimensions available on request.

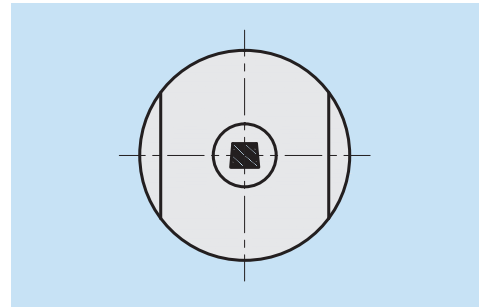
All dimensions in mm

Single Point CVD Dressers



Single Point Dressers with CVD needles

This single point dresser consists of a synthetic CVD needle gripped in a holder. The advantage of the synthetic diamond over the natural one is that its precise geometry is retained over the whole of its working life. This guarantees an uniformly high surface finish that can be reproduced every time without the need to change any process variables such as feed. It is therefore highly suitable for CNC dressing processes and the machining of small grinding wheels, including profiled ones, and internal cylindrical grinding. There is a cutout in the head of the dresser to make it easier to position the needle correctly with respect to the grinding wheel when setting up. Since this is a CVD needle, its orientation to the grinding wheel has no significant effect on the tool life of the dresser. Nevertheless it should be noted that the diagonal mounting leads to a greater overlap (T dimension). The CVD is sintered into the shank horizontally with respect to the cutout and in this position the T dimension is the smallest.



Standard range of single point dressers with CVD needles

Needle Dimensions			Shank Type
D	T	L	
0.4	0.4	4	MT0
0.4	0.4	4	MT1
0.4	0.4	4	Ø10 x 50
0.6	0.6	4	MT0
0.6	0.6	4	MT1
0.6	0.6	4	Ø10 x 50
0.8	0.8	4	MT0
0.8	0.8	4	MT1
0.8	0.8	4	Ø10 x 50
1.2	1.2	4	MT0
1.2	1.2	4	MT1
1.2	1.2	4	Ø10 x 50

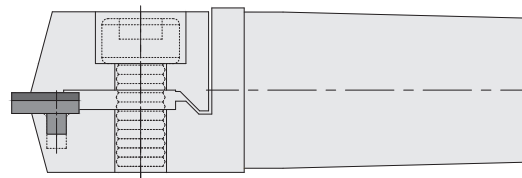
Other shank dimensions available on request.

All dimensions in mm

PCD and CVD Insert Dressers

This economical tool has three working points on a defined radius that can be brought into play by rotating the insert.

A certain amount of regrinding is possible to create the next largest radius.

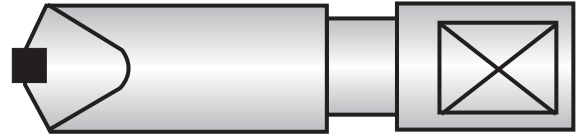


Tool	Type	Shank Length A	Radius R
	PCD	6.0	0.125
		6.0	0.200
		6.0	0.250
		6.0	0.500
		6.0	0.800
		6.5	0.125
		6.5	0.200
		6.5	0.250
		6.5	0.500
		6.5	0.800
	CVD	7.0	0.125
		7.0	0.200
		7.0	0.250
		7.0	0.500
		6.0	0.125
		6.0	0.200
		6.0	0.250
		6.0	0.500
		6.0	0.800
		6.5	0.125
	PCD MT1	6.5	0.200
		6.5	0.250
		6.5	0.500
		6.5	0.800
		7.0	0.125
		7.0	0.200
		7.0	0.250
		7.0	0.500
		7.0	0.800
	MT-1		

More holder shapes on request

All dimensions in mm

Shaping Tools



Profiling and copy dressing of grinding wheels, make high demands on profile retention capability and thus on wear - resistance of the diamond tool.

Wherever diamond blade type tools can not meet these requirements due to the specific grinding wheel geometry, precision ground shaping tools are the solution. Shaping tools feature the unique "structure-cut" to ensure optimum tool life. They are manufactured only from the highest grade of natural diamonds and undergo stringent quality control during manufacturing.

Important Point to consider :

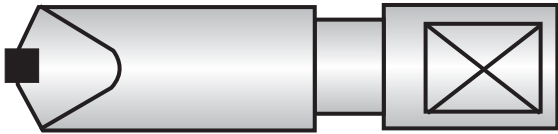
- Choose a diamond with the largest included angle and toughest geometric shape allowed by the profile requirements.
- Use a drag angle, where possible to maximize cutting edge life.
- Make sure that the tool is rigidly mounted.
- Follow machine manufacturer's instructions and recommendations.

TYPE	CAT NO.	RADIUS IN MM	DIMENSIONS
Diaform	SF 4125 SF 4250 SF 4500	0.125 0.250 0.500	
Diaform	SF 4125 SF 4250 SF 4500	0.125 0.250 0.500	

Other shank dimensions available on request.

All dimensions in mm

Shaping Tools

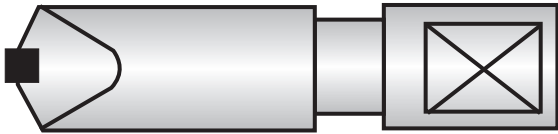


TYPE	CAT NO.	RADIUS IN MM	DIMENSIONS
Diaform	SF 6125 SF 6250 SF 6500	0.125 0.250 0.500	
Diaform	SF 6125 SF 6250 SF 6500	0.125 0.250 0.500	
TYPE	CAT NO.	DIMENSIONS	DIMENSIONS
Diaform	SF 6632 SF 6633 SF 6672 SF 6673	9.52 x 60 mm 9.52 x 75 mm 11.00 x 60 mm 11.00 x 75 mm	

Other shank dimensions available on request.

Dimensions in mm

Shaping Tools



TYPE	CAT NO.	DIMENSIONS
Copying	Fortuna	
Copying	Schaudt	
60° Lapped Dressing Tool	Diamonds are ground and lapped to precise angles. Tolerance: centerset to T.I.R.± .002 Specify Ø A & B	

Note: Grinding Wheels with grain size coarser than 60 mesh produce especially heavy wear on shaping tools

All dimensions in mm

Cluster Dressers

Cluster type diamond dressers consist of a number of small natural, diamond of good crystal character, set in a geometric pattern in single layer and sintered into a special wear resistant bond.

The cluster type diamond dresser is ideal for coarse or rough dressing of grinding wheels in sizes up to 80 grit (mainly rough grinding or grinding to eliminate imbalance). The diamonds can be fully utilised without re-setting or re-sharpening.

Dressing costs are substantially reduced as the diamond used in this type of dressers are much smaller in size than single point diamond dressers, so they are much economical.

Cluster type diamond dressers give rapid-dressing and produce a consistent even surface on the grinding wheel. These dressers are resistant to shock and impact.

The dressing face of the cluster type diamond dresser should be set at an angle of 90° to the grinding wheel so that all the diamond points are in contact at the same time.

Depth of cut stroke of the dresser : 0.01-0.05 mm max.

Feed rate - in mm per revolution :

0.3-1.5 mm max

Finer infeeds & smaller cuts will produce higher surface finishes. Normal wheel speeds should be used.

An adequate supply of coolant should be used both before and during the dressing operation, in order to prolong tool life.

Cluster Dressers



SIZE	CT. WT.	DIMENSIONS
5/D	0.75	
7/D	1.05	
9/D	1.00	
12/D	1.00	

Our standard is 5/8" x 6" long. If required in other sizes, kindly specify D & L
 All dimensions in mm

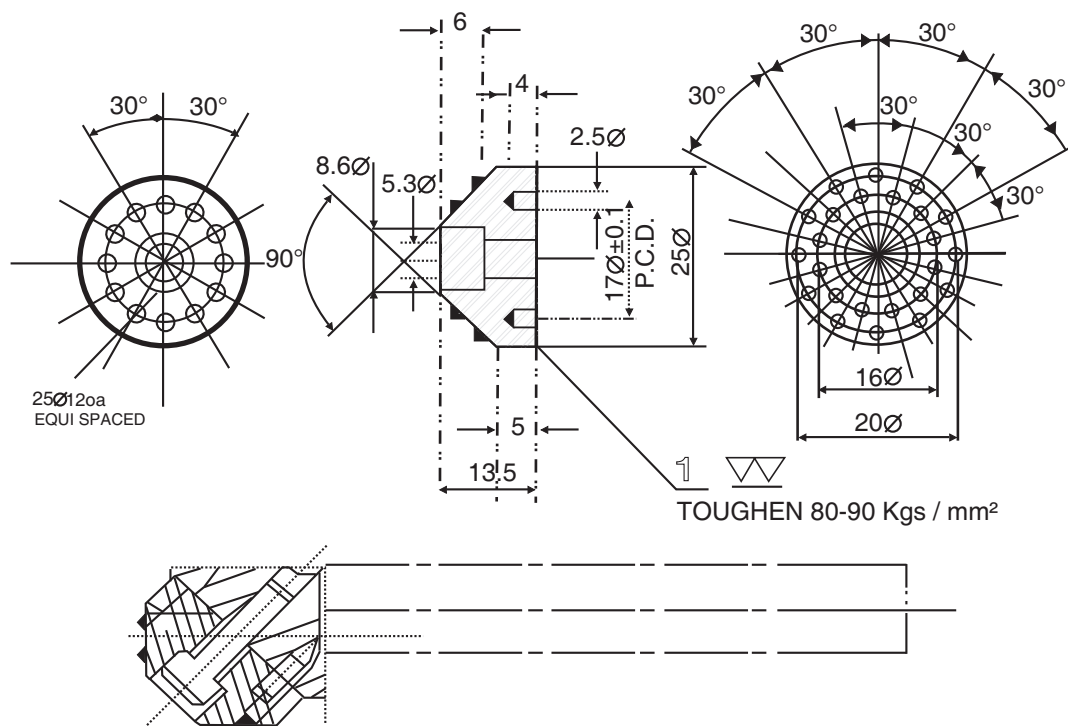
A diagram showing a cross-section of a composite material. It consists of a rectangular block with a diagonal interface. The upper-left portion is a matrix material, indicated by a stippled pattern. The lower-right portion is a fiber-reinforced matrix, indicated by a diagonal line pattern. The interface between the two materials is a diagonal line. The entire block is surrounded by a thin layer of matrix material.

APPLICATIONS:

- ### ADVANTAGES:

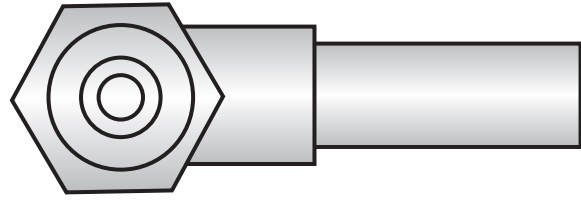
-

- MIC-24 with 24 Diamonds for wheel size up to 600 mm diameter wheel.
- MIC-36 with 36 Diamonds for wheel size above 600 mm diameter wheel.



All dimensions in mm

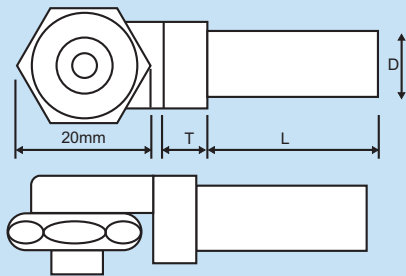
Hexagonal Disc Diamond Dressers



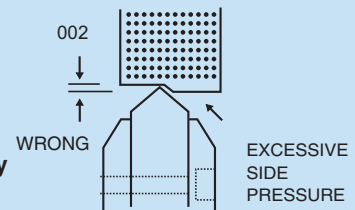
Six small elongated whole diamonds selected with care for quality and sameness in shape are sorted into matched sets and set in Hexagonal Discs. The Hexagonal Disc can be mounted in holders, which are made to customer's specification.

APPLICATION

On all wheels upto the size of 12 "O.D. x 1" wide, Diamonds can be completely used up. Nothing is wasted. The small and constant contact area they present to the wheel has many advantages. They will condition the grinding wheel consistently and will produce the desired finish and grinding characteristics. The grinding wheel will be dressed sharper and so produce more accurate parts between each dressing. Since light cuts can dress a grinding wheel with great efficiency, grinding wheel wear will be reduced considerably.

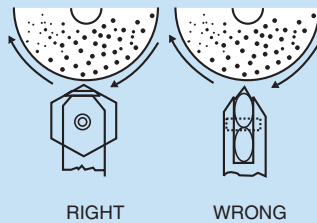


Use plenty of coolant at the start of each dressing. Never start dry & then turn on coolant

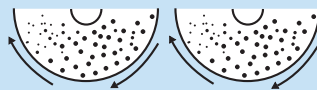


Best results are obtained with 0.001" cuts for rough dressing and 0.0005" for finishing

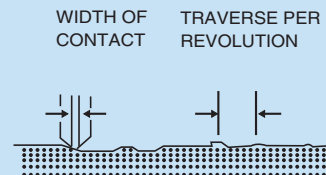
Tighten set screws securely



Mount the disc parallel to the direction of the grinding wheel, never at 90°

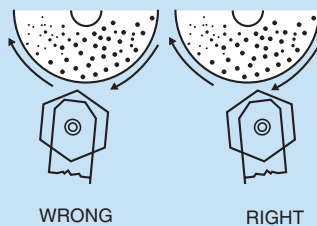


Regulate the traverse for finish required. A fast traverse will open wheels and produce a coarse finish. A slow traverse produces a finer finish.



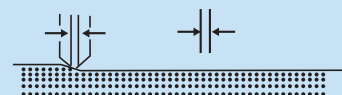
Traverse rate may be too fast & produce a thread on the wheel if the feed width exceeds the width of the diamond contact area.

Point the diamond slightly above or past the centre line of grinding wheel. A 5° to 10° drag angle is preferred.



Traverse is too slow if it advances the diamond only a fraction of the width of contact area per revolution.

WIDTH OF CONTACT TRAVERSE PER REVOLUTION

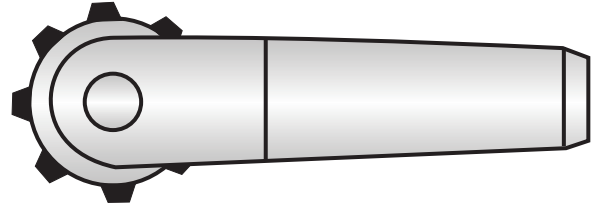


Therefore, regulate the traverse in relation to the size of the diamond used in disc. Use a faster traverse for larger stones, a slow traverse for smaller stones.

Other shank dimensions available on request.

All dimensions in mm

Multipoint Disc



Multipoint Disc dressers are normally used in small grinding wheels on internal grinding machines. The diamonds are set evenly in rows across the face of the disc. First class needle shape diamonds are used, set in a special sintered bonds. Multipoint disc dresser are perfectly simple to use. Its operation is basically the same as that of a single point diamond dresser except that, after each row of diamonds has been used, new points can be put into operation simply by rotating the disc slightly.

An ample supply of coolant and depth of cut of 0.02 - 0.03 mm. max are prerequisite for long tool life. Multipoint disc dressers can be used at any angle and therefore in any application.

To optimize the life of multipoint disc type dresser, we recommend that the complete disc be turned 180° from time to time to utilise the self sharpening effect produced by wear.

CAT. NO.	CARAT WT.	DIMENSIONS	HOLDER TYPE	RECOMMENDATION
MD 20	2.00			FOR DRESSING OF GRINDING WHEEL WITH STRAIGHT WORKING FACES
MD 20	3.00			FOR DRESSING OF GRINDING WHEEL WITH STRAIGHT WORKING FACES

Other shank dimensions available on request.

All dimensions in mm

Diamond Grit Impregnated Dressers

Diamond grit impregnated dressers have been developed from multi-point dressers. In contrast to the latter they are manufactured from diamond grit rather than a larger number of small natural diamonds. The advantages of the diamond impregnated dresser lie in its exceptional sharpness, which results from sharp edges and points of the diamond grit.

Diamond grit impregnated dressers are ideally suited to the following applications, dressing resin, vitreous and rubber bond, fine grit and even "grit free" grinding wheels, as well as boron carbide grinding wheels, dressing single profile threaded and V-profile grinding wheels, for general dressing operations on centreless, cylindrical and surface grinding machines.

Diamond grit impregnated dressers are more economical because of their low initial cost and their resistance to shock and impact which prevents shattering.

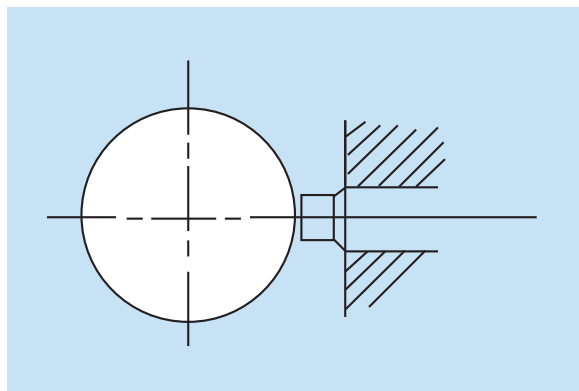
Dressing times are reduced as higher feed rates can be used. There is an unlimited number of sharp pull-out free cutting edges contained in the crushed diamond grit.

Diamond grit impregnated dressers demand greater care in selecting the correct dressers for a given application. The bond and diamond grit size used are both variable according to the type of grinding wheels to be dressed. The size of the diamond grit particles should be matched to the grit size of the grinding wheel.

Instructions for Use :

Normal dressing speeds are used. A plentiful supply of coolant should be provided both before and during dressing to prolong dresser life. The diamond grit impregnated cutting face of the dresser should be set at an angle of 90° to the grinding wheel to be dressed, so that all the cutting edges of the diamonds grit are able to make contact with the wheel face.

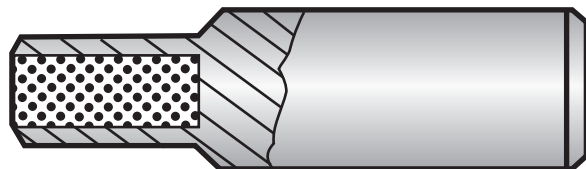
The feed rates used may be double of those used with single-point diamond dressers.



The depth of cut should be as follows :
finishing - approx 0.01 mm
rough grinding - approx 0.02 mm

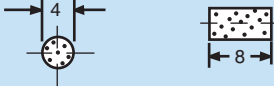
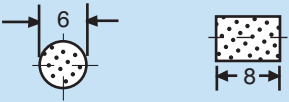
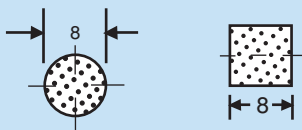
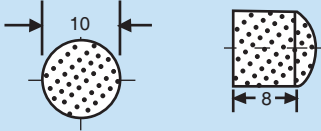
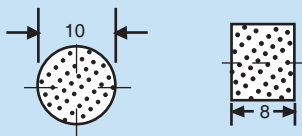
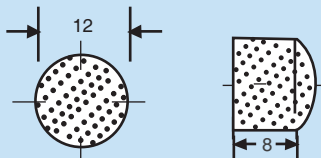
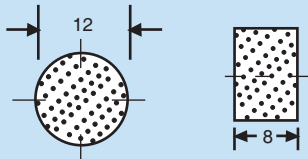
*Note : While ordering please specify
'D' & 'L' dimensions & bond.*

Diamond Grit Impregnated Dressers



Long Life : Load is divided on many diamond particles in tough durable matrix.

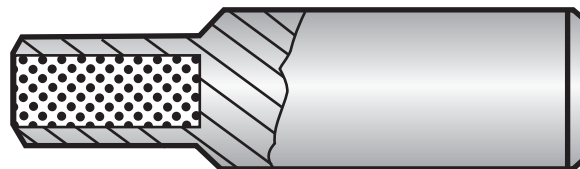
No Resetting : In DGI Diamond Particles are totally consumed. The result is reduction in inventory.

CATALOGUE NO.	DIAMOND SECTION	DIAMOND SIZE IN MICRONS	BOND
TCD-4		600	H M J
TCD-5		600	H M J
TCD-6		600	H M J
TCD-8		1000	H M J
TCD-10		1000	H M J
TCD-10-P		1000	H M J
TCD-12		1000	H M J
TCD-12-P		1000	H M J

DGI Diamond Dressers all also available in different Diamond Grit size.

All dimensions in mm

Diamond Grit Impregnated Dressers



Economy : Dressing accomplished with maximum efficiency resulting in more pieces per dress.

Versatile : DGI are used for the dressing of the out side diameter and side face of fine to coarse grinding wheels.

CATALOGUE NO.	DIAMOND SECTION	DIAMOND SIZE IN MICRONS	BOND
TCD-15		1000	H M J
TCD-15-P		1000	H M J
TCD-BL-1 10x10x6		1000	H M J
TCD-BL-2 15x10x7		1000	H M J
TCD-BL-3 20x15x7		1000	H M J

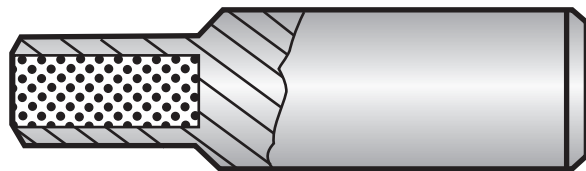
CATALOGUE NO.	DIAMOND SIZE IN MICRONS	DIAMOND SIZE IN MM	
86	F F F F F F 4 F 5 F	160 130 110 90 70	SOLAR THREAD DRESSERS Diamond Grit Impregnated Thread Dressers are used for finish grinding i.e. on screw thread, gear and profile grinding machines as well as on tool and plain grinder.
64	F F F F F F 4 F 5 F	160 130 110 90 70	* LIGHT DRESSING FORCE * ACUTE ANGLED WHEEL PROFILE CAN BE MAINTAINED. * EFFECTIVE OPEN STRUCTURE OF GRINDING WHEEL IS MAINTAINED.

J = Tungsten Base Bond, M&K5 = Special Tungsten Carbide Base Bond, H = Special Tungsten Moly Base Bond.

Other shank dimensions available on request.

All dimensions in mm

Diamond Grit Impregnated Dressers



HOLDERS FOR DIAMOND GRIT IMPREGNATED

Cylindrical Holder	
Cylindrical Holder	
Cylindrical Holder with Head	
Morse taper 0	
Morse taper 1	

Other shank dimensions available on request.
All dimensions in mm

Blade Dressers Analysis of Economy Consideration & Process Advantages

Introduction :

Blade dressers are basically conceived from the multi - point wheel dressing concept - as an extension to the areas with a stringent control demand on quality & economy. The basic advantages which have, lead to the extensive use of blade dressers are:

1. They are very economical in comparison to single-point dressers.
2. Higher from retention capability compared to single point dressers.
3. Minimum in-process service attention compared to any other dressers due to their self-wearing property.
4. They are ideally suited for optimum dressing condition and in turn for optimum grinding conditions.
5. Greater flexibility in selection from a wide range of varieties of dressers to suit different grinding wheel specifications and grinding conditions.

The following paragraphs offer in-depth study and detailed analysis of the above attributes.

Economic considerations:

Blade diamonds are composed of thin natural diamond needles which are much cheaper than larger single point diamonds in direct consideration of weight basis. The impact of this economy will be felt to a greater extent when we try to replace the costlier chisel points, single points and indexable crowns dressers.

From retention capability:

A single point or a chisel point has a limitation that in certain special applications like dressing of wheels, within 15 to 20 hours of running. The condition of the dresser tips deteriorate to such a degree that the repeatability of form & related tolerances on the components are adversely affected. This results in the necessity to reset the dressers with fresh cutting points.

Blade dressers are designed to utilize their full life span with minimum deterioration of form and tolerances. Fig. 1 (page 26) gives certain typical examples or areas where certain steep angles and sharp internal corners are effectively traced with precision blades in comparison to ordinary single point dressers and ordinary blade dressers.

Minimum in-process service attention:

Normally, when a single point or a chisel point dresser is mounted, the machinist has to "watch" for a number of defects on the component.

1. "Glazing" of the wheel due to "blunting" of diamonds.
2. Loss of form & profiles.
3. "Breaking of wheel corners:
4. Appearance of "unstraightness" due to varying load conditions on the dressers.

Blade dressers have been developed on the "fix and forget" principal - a concept of the right choice of dresser for an operation - when the next attention of the machines is warranted only when the dresser is fully used up.

Optimised Conditions of the grinding wheel :

Modern grinding technology has facilities to optimise grinding process to the barest minimum operational cost-provided. The very starting point of the operation, namely dressing, is optimised. A proper dressing demands the following conditions on the grinding wheel surface.

- 1, A pure abrasive action - no "rubbing" action.
2. Proper fracture of individual grains to expose maximum abrasive area for grinding
3. Minimum "filling" of bonding cavities on the wheel surface to minimise friction during grinding operation.
4. Minimum "grain pull out".

Flexibility in selection :

Unlike single point dressers which are more or less independent of the grinding wheel specifications or conditions (except for the weight in carats), blade dressers need to be selected with due considerations to the grinding wheel specification and conditions of dressing.

Conclusion:

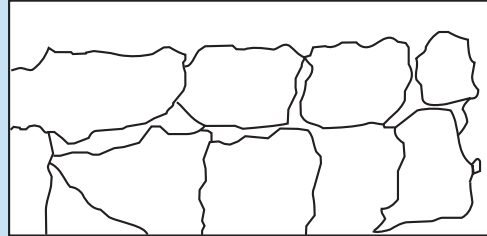
Blade dressers have been developed over the last two decades through extensive field trials with renowned engineering industries. The benefits derived have been passed on to the several users, through substantial reduction in their tool costs.

Dressing Conditions

What happens when dress "Too Slow"

Grains Too Smooth

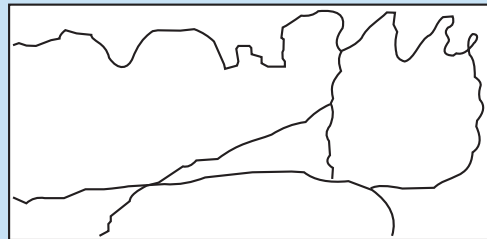
1. Poor cutting action
2. Chatter marks
3. Burning & cracks



What happens when dress "Idle Pass"

Sharp points on wheel grains are made blunt

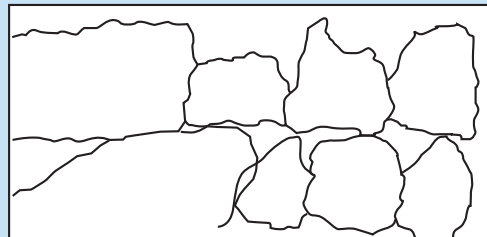
1. Poor cutting action
2. Unevenness (Waviness)



Wheel dressed with a high depth of cut

Grains broken and pulled out

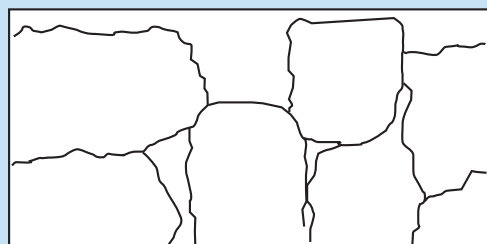
1. Very rough finish
2. Wheel gets loaded too soon



What happens when we dress "Dry"

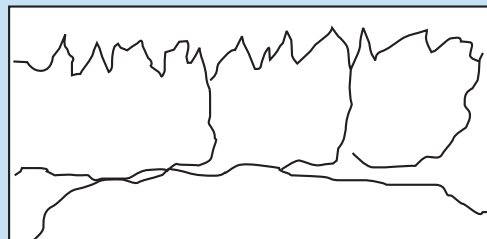
Grains pulled out due to bond failure

1. Very rough finish
2. Change in ground form & taper
3. Wheel gets loaded



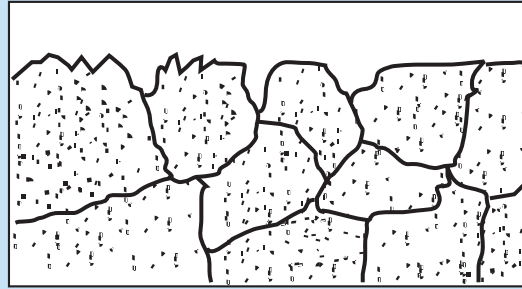
What happens when we dress "Correctly"

1. Sharp edges on grains
2. No cavities

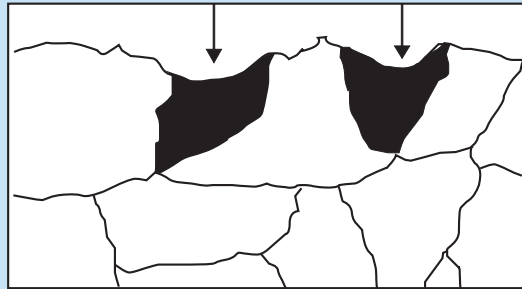


Grinding Wheel Surface Generated by Dressing With Single Point & Blade Dressers - A Comparative Study

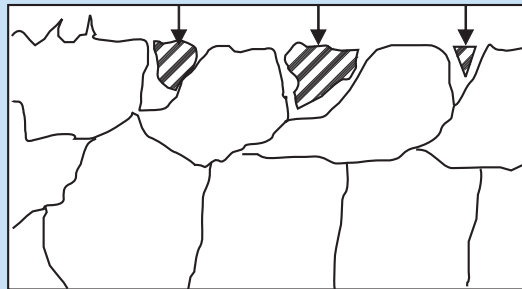
With single point dresser with an idle pass for "better finish" wheel grains are completely burnished resulting in total loss of abrasive action



With a "blunt" single point dresser grains have been pulled out resulting in cavities and chances of wheel getting loaded quickly grinding during operation

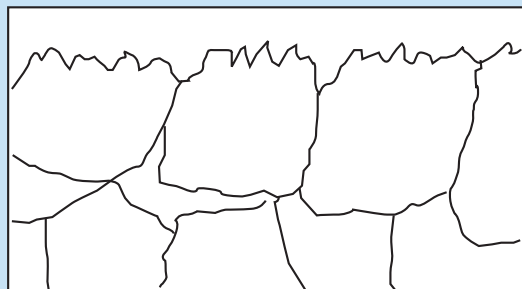


With a single point dresser at a lower dressing rate for "better finish" cavities filled with loose unbounded abrasive grains which initially result in a rubbing action and later in "wheel loading"



With blade dresser notable features

1. Proper grain fracture and greater abrasive action of individual grains
2. No cavity formation - less chances of wheel loading - greater abrasive area
3. No grains pull out - greater abrasive area
4. No loose grains "filled up" consistency in surface finish

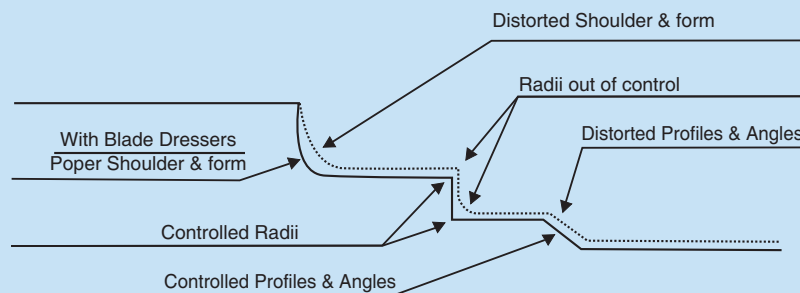


Blade Type Dressers

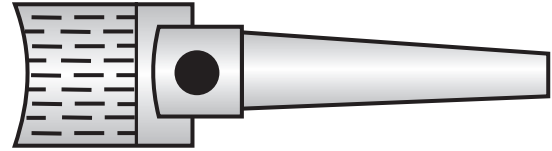
Introduction:	On few heavy-duty grinders, especially centerless grinders, often the demands are high both on quality and productivity with the following essential characteristics of wheel dressing; 1) Uniform dressing over the full strength of wheel. 2) Proper abrasive glaze-free surface on the wheel. 3) Wheel edges free of broken edges. At the same time, from the economic point of view, the dresser becomes expensive when not properly designed to meet all the requirements. However, a combination dresser has been conceived to combine quality with economy.
Brief description:	The dresser consists of three dressing blades set in a bronze shank (like any mother blade dressers) in the form of a sandwich. The blades are set with gaps to ensure a proper follow up action during dressing. The middle blade serves as the main load carrying member. The other two blades serve a leading and lagging cutting point to ensure a glaze free dressings.
Cost comparison/ economy:	This dresser is supposed to give nearly three to four time than the life span with a normal blade dresser, and can be expected to result in a net cost saving of around 40% on tooling cost.
Common applications :	1) Centreless grinding (plain) 2) Cylindrical grinding with wheels (500 mm, and above in dia.) 3) Surface grinding (TOS, BLOHM and Other heavy duty large machines.)

Fig. 1

A Comparative Case Study Blade Dressers Vs Single Point



Blade Type Dressers

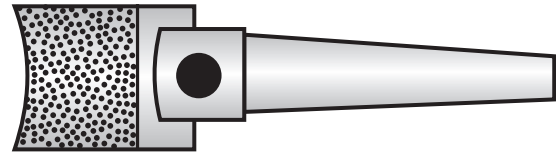


Needle blade with natural diamond

TYPES	X MM	CATALOGUE NO.	BLADE DIMENSIONS IN MM
SA Dimensions of The Diamond Plate 20 x 15 x X	0.75 mm 0.90 mm 1.10 mm 1.40 mm	SA - 075 SA - 090 SA - 110 SA - 140	
SB Dimensions of The Diamond Plate 10 x 15 x X	0.75 mm 0.90 mm 1.10 mm 1.40 mm	SB - 075 SB - 090 SB - 110 SB - 140	
SC Dimensions of The Diamond Plate 15 x 10 x X	0.75 mm 0.90 mm 1.10 mm 1.40 mm	SC - 075 SC - 090 SC - 110 SC - 140	
SD Dimensions of The Diamond Plate 10 x 10 x X	0.75 mm 0.90 mm 1.10 mm 1.40 mm	SD - 075 SD - 090 SD - 110 SD - 140	
FA Dimensions of The Diamond Plate 20 x 15 x X	0.75 mm 0.90 mm 1.10 mm 1.40 mm	FA - 075 FA - 090 FA - 110 FA - 140	
FB Dimensions of The Diamond Plate 10 x 15 x X	0.75 mm 0.90 mm 1.10 mm 1.40 mm	FB - 075 FB - 090 FB - 110 FB - 140	
FC Dimensions of The Diamond Plate 15 x 10 x X	0.75 mm 0.90 mm 1.10 mm 1.40 mm	FC - 075 FC - 090 FC - 110 FC - 140	
FD Dimensions of The Diamond Plate 10 x 10 x X	0.75 mm 0.90 mm 1.10 mm 1.40 mm	FD - 075 FD - 090 FD - 110 FD - 140	

All dimensions in mm

Blade Type Dressers

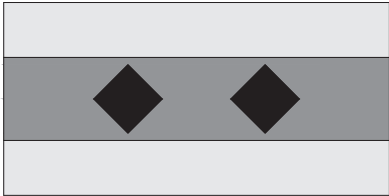


Standard blade with diamond grit

TYPES	X MM	FEPA	CATALOGUE NO.	BLADE DIMENSIONS IN MM
SAS Dimensions of The Diamond Plate 20 x 15 x X	0.75 mm 0.90 mm 1.15 mm 1.40 mm	D501 D711 D1001 D1181	SAS - 075 SAS - 090 SAS - 115 SAS - 140	
SBS Dimensions of The Diamond Plate 10 x 15 x X	0.75 mm 0.90 mm 1.15 mm 1.40 mm	D501 D711 D1001 D1181	SBS - 075 SBS - 090 SBS - 115 SBS - 140	
SCS Dimensions of The Diamond Plate 15 x 10 x X	0.75 mm 0.90 mm 1.15 mm 1.40 mm	D501 D711 D1001 D1181	SCS - 075 SCS - 090 SCS - 115 SCS - 140	
SDS Dimensions of The Diamond Plate 10 x 10 x X	0.75 mm 0.90 mm 1.15 mm 1.40 mm	D501 D711 D1001 D1181	SDS - 075 SDS - 090 SDS - 115 SDS - 140	
FAS Dimensions of The Diamond Plate 20 x 15 x X	0.75 mm 0.90 mm 1.15 mm 1.40 mm	D501 D711 D1001 D1181	FAS - 075 FAS - 090 FAS - 115 FAS - 140	
FBS Dimensions of The Diamond Plate 10 x 15 x X	0.75 mm 0.90 mm 1.15 mm 1.40 mm	D501 D711 D1001 D1181	FBS - 075 FBS - 090 FBS - 115 FBS - 140	
FCS Dimensions of The Diamond Plate 15 x 10 x X	0.75 mm 0.90 mm 1.15 mm 1.40 mm	D501 D711 D1001 D1181	FCS - 075 FCS - 090 FCS - 115 FCS - 140	
FDS Dimensions of The Diamond Plate 10 x 10 x X	0.75 mm 0.90 mm 1.15 mm 1.40 mm	D501 D711 D1001 D1181	FDS - 075 FDS - 090 FDS - 115 FDS - 140	

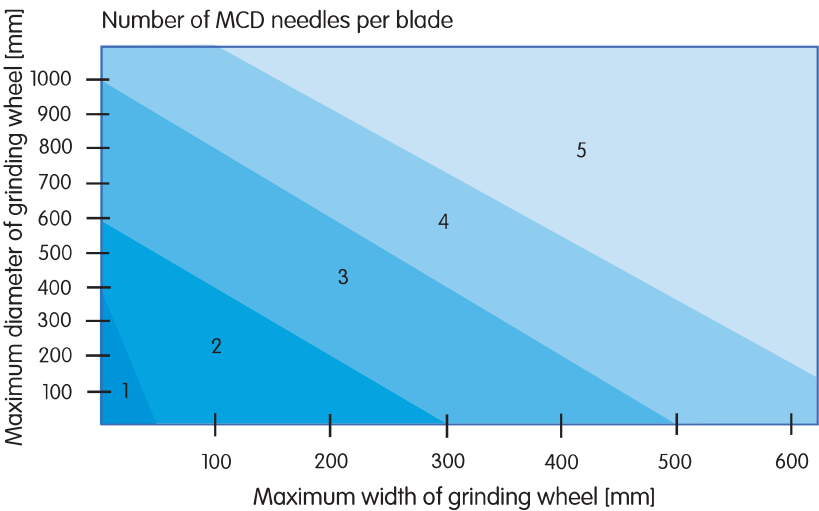
All dimensions in mm

Blade Type Dressers



Standard Blade with MCD needle

Preferably for profiling, but also for the straight dressing of hard grinding wheels, sintered alumina and silicon carbide grinding wheels. For straight plunge dressing we recommend the version with the hard material in the centre; for angular plunge dressing the off centred (OC) arrangement is suitable.



Selecting the right blade tool

We have made it easy for you to select the most suitable blade dresser:

- Simply choose the appropriate blade size from the diagram according to the width and diameter of your grinding wheel.
- Then choose the best blade tool from the table below.

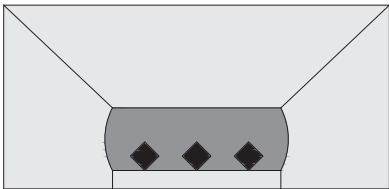
Standard range (centred version)

	Number of needles	Grit size Grinding wheel (Mesh)	Designation	Effective cutting width T	width at tip B	Item Code
	1	80-120 60 46	2465/1 2485/1 24115/1	0.8 1.1 1.5	4.0 4.0 4.0	FBD2100001 FBD2100002 FBD2100003
	2	80-120 60 46	2465/2 2485/2 24115/2	0.8 1.1 1.5	6.0 6.0 6.0	FBD2100004 FBD2100005 FBD2100006
	3	80-120 60 46	2465/3 2485/3 24115/3	0.8 1.1 1.5	8.0 8.0 8.0	FBD2100007 FBD2100008 FBD2100009
	4	80-120 60 46	2465/4 2485/4 24115/4	0.8 1.1 1.5	10.0 10.0 10.0	FBD2100010 FBD2100011 FBD2100012
	5	80-120 60 46	2465/5 2485/5 24115/5	0.8 1.1 1.5	10.0 10.0 10.0	FBD2100013 FBD2100014 FBD2100015

All dimensions in mm

Blade Type Dressers

Standard OC Blade with MCD needle



Standard range (off-centred version, oc)

	Number of needles	Grit size Grinding wheel (Mesh)	Designation	Effective cutting width T	width at tip B	Item Code
	1	80-120	2465-OC/1	0.8	4.0	FBD2200001
		60	2485-OC/1	1.1	4.0	FBD2200002
		46	24115-OC/1	1.5	4.0	FBD2200003
	2	80-120	2465-OC/2	0.8	6.0	FBD2200004
		60	2485-OC/2	1.1	6.0	FBD2200005
		46	24115-OC/2	1.5	6.0	FBD2200006
	3	80-120	2465-OC/3	0.8	8.0	FBD2200007
		60	2485-OC/3	1.1	8.0	FBD2200008
		46	24115-OC/3	1.5	8.0	FBD2200009
	4	80-120	2465-OC/4	0.8	10.0	FBD2200010
		60	2485-OC/4	1.1	10.0	FBD2200011
		46	24115-OC/4	1.5	10.0	FBD2200012
	5	80-120	2465-OC/5	0.8	10.0	FBD2200013
		60	2485-OC/5	1.1	10.0	FBD2200014
		46	24115-OC/5	1.5	10.0	FBD2200015

Radius and angle pregrinding

Blade type dressers MCD & CVD are available with the diamond radius and angle preground.

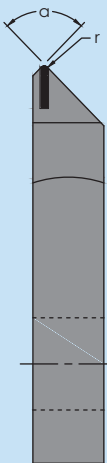
The advantages of pre-polishing are

- Reduction of the work needed to change the tool as it takes less time to match the dresser to the profile of the grinding wheel,
- Adherence to profile directly after tooling change, even for high precision profiles with a radius of only 0.125 mm.

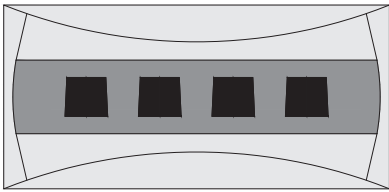
SR. NO.	ANGLE (a)	RADIUS (r)
1	88°	0.10
2	88°	0.125
3	88°	0.15
4	88°	0.20
5	88°	0.25
6	88°	0.30

Information on toolholders for diamond blade dressers are given on page no. 34
All dimensions in mm

Example of special blade tools with pre-polished profile

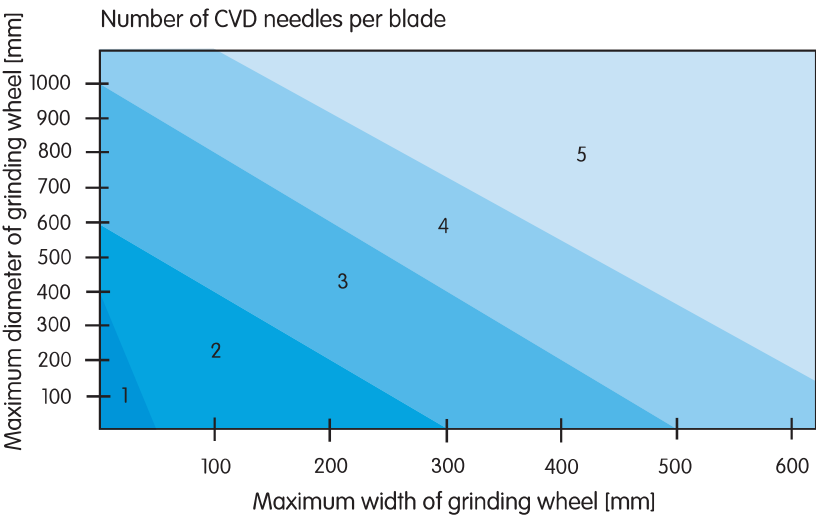


Blade Type Dressers



Standard Blade with CVD needle

Because the CVD diamond material is centred, this blade is the first choice for high precision straight dressing of alumina, special fused alumina and sintered alumina grinding wheels.
A highly durable tool with straight CVD needle inserts.

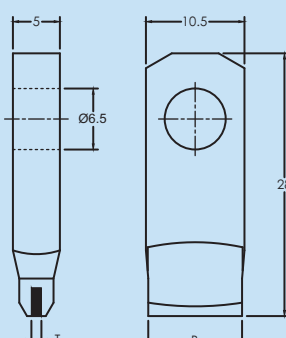


Selecting the right blade tool

We have made it easy for you to select the most suitable blade dresser:

- Simply choose the appropriate blade size from the diagram according to the width and diameter of your grinding wheel.
- Then choose the best blade tool from the table below.

Standard range (centred version)

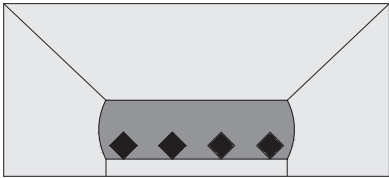
	Number of needles	Grit size Grinding wheel (Mesh)	Designation	Effective cutting width T	width at tip B	Item Code
	1	150-240	3144/1	0.4	3.0	FBD1100001
		80-120	3164/1	0.6	3.0	FBD1100002
		60	3184/1	0.8	3.0	FBD1100003
		46	31124/1	1.2	4.0	FBD1100004
	2	150-240	3144/2	0.4	4.0	FBD1100005
		80-120	3164/2	0.6	4.0	FBD1100006
		60	3184/2	0.8	5.0	FBD1100007
		46	31124/2	1.2	6.0	FBD1100008
	3	150-240	3144/3	0.4	5.0	FBD1100009
		80-120	3164/3	0.6	6.0	FBD1100010
		60	3184/3	0.8	7.0	FBD1100011
		46	31124/3	1.2	8.0	FBD1100012
	4	150-240	3144/4	0.4	6.0	FBD1100013
		80-120	3164/4	0.6	8.0	FBD1100014
		60	3184/4	0.8	9.0	FBD1100015
		46	31124/4	1.2	10.0	FBD1100016
	5	150-240	3144/5	0.4	7.0	FBD1100017
		80-120	3164/5	0.6	10.0	FBD1100018
		60	3184/5	0.8	10.0	FBD1100019
		46	31124/5	1.2	10.0	FBD1100020

Information on toolholders for diamond blade dressers are given on page no. 34

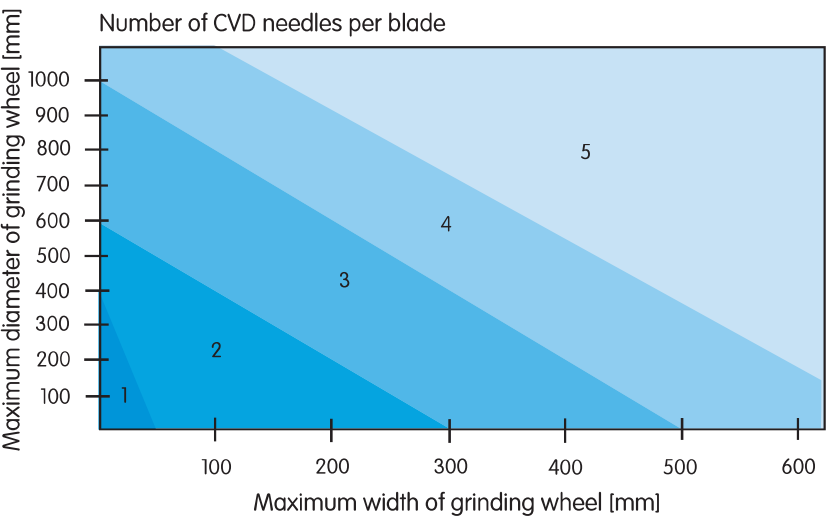
All dimensions in mm

Blade Type Dressers

Standard OC Blade with CVD needle



This blade with its off-centred CVD material is a first choice for angular plunge dressing of all alumina, special fused alumina and sintered alumina grinding wheels.
A highly durable tool with CVD needles inserted diagonally.



Selecting the right blade tool

We have made it easy for you to select the most suitable blade dresser:

- Simply choose the appropriate blade size from the diagram according to the width and diameter of your grinding wheel.
- Then choose the best blade tool from the table below.

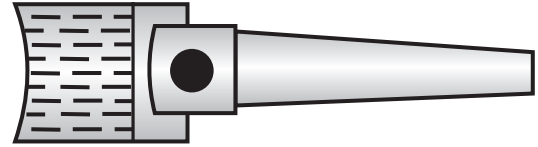
Standard range (off-centred version, oc)

	Number of needles	Grit size Grinding wheel (Mesh)	Designation	Effective cutting width T	width at tip B	Item Code
	1	150-240	3344-OC/1	0.6	3.0	FBD1200001
		80-120	3364-OC/1	0.8	3.0	FBD1200002
		60	3384-OC/1	1.1	3.0	FBD1200003
		46	33124-OC/1	1.5	4.0	FBD1200004
	2	150-240	3344-OC/2	0.6	4.0	FBD1200005
		80-120	3364-OC/2	0.8	4.0	FBD1200006
		60	3384-OC/2	1.1	5.0	FBD1200007
		46	33124-OC/2	1.5	6.0	FBD1200008
	3	150-240	3344-OC/3	0.6	5.0	FBD1200009
		80-120	3364-OC/3	0.8	6.0	FBD1200010
		60	3384-OC/3	1.1	7.0	FBD1200011
		46	33124-OC/3	1.5	8.0	FBD1200012
	4	150-240	3344-OC/4	0.6	6.0	FBD1200013
		80-120	3364-OC/4	0.8	8.0	FBD1200014
		60	3384-OC/4	1.1	9.0	FBD1200015
		46	33124-OC/4	1.5	10.0	FBD1200016
	5	150-240	3344-OC/5	0.6	7.0	FBD1200017
		80-120	3364-OC/5	0.8	10.0	FBD1200018
		60	3384-OC/5	1.1	10.0	FBD1200019
		46	33124-OC/5	1.5	10.0	FBD1200020

Information on toolholders for diamond blade dressers are given on page no. 34

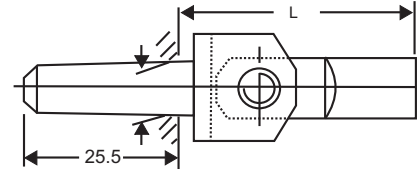
All dimensions in mm

Blade Type Dressers

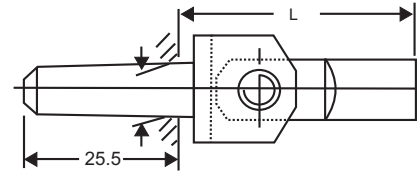


Swivelling holders for blade type tools

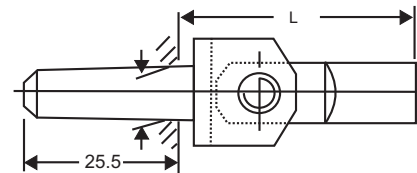
Shank MT 1 with Blade	FA	SA	FB	SB	FC	SC	FD	SD
L Approx	37		37		32		32	



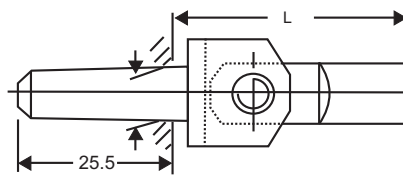
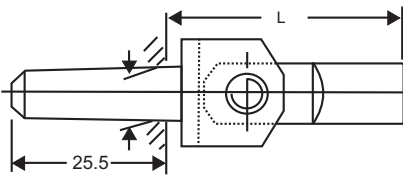
Cylindrical Shank With Blade	FA	SA	FB	SB	FC	SC	FD	SD
L Approx	37		37		32		32	



Shank MT 0 with Blade	FA	SA	FB	SB	FC	SC	FD	SD
L Approx	39.5		39.5		34.5		34.5	

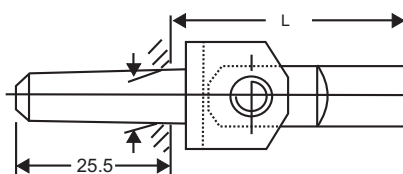
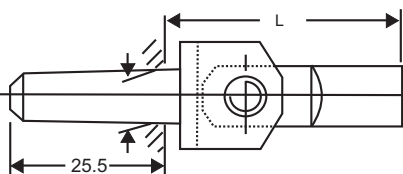


Diamond blades rigidly brazed in the shank



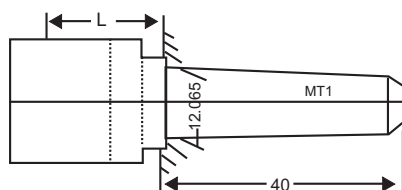
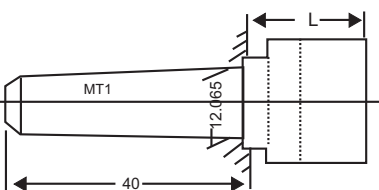
Cylindrical shank with Blade	FA	SA	FB	SB	FC	SC	FD	SD
L Approx	25		25		20		20	

Angle, L1 and shank-diameter according to stated requirements



Shank MT 1 or MT0 with blade	FA	SA	FB	SB	FC	SC	FD	SD
L Approx	25		25		20		20	

Angle according to stated requirements

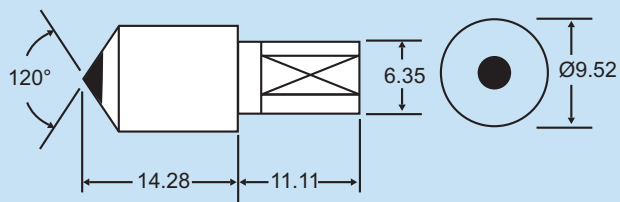
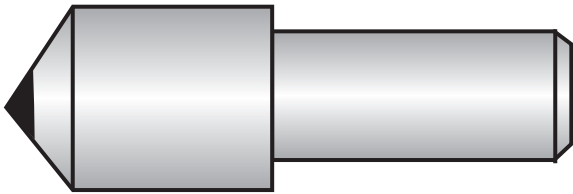


Shank MT 1 or MT0 with blade	FA	SA	FB	SB	FC	SC	FD	SD
L Approx	23		23		18		18	

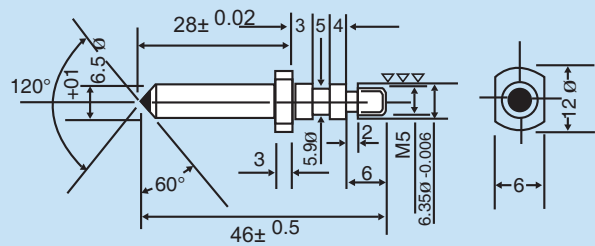
Other shank dimensions available on request.

All dimensions in mm

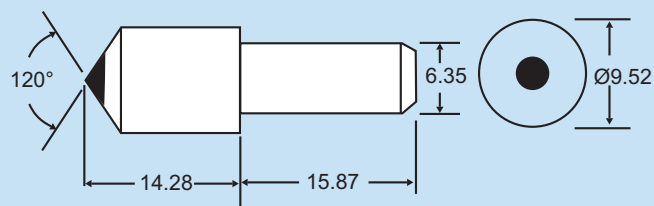
Diamond Indenters



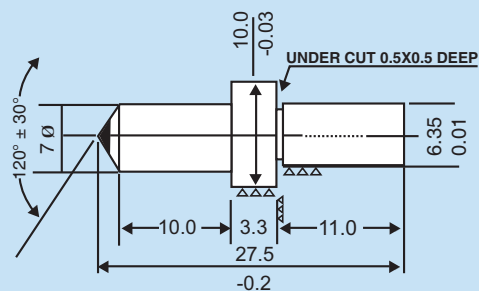
Rockwell



Reichert



Avery



Rockwell

Other shank dimensions available on request.
Dimensions in mm

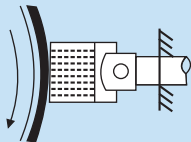
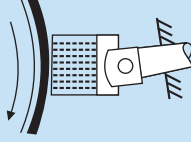
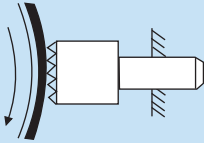
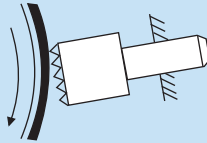
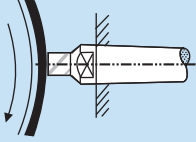
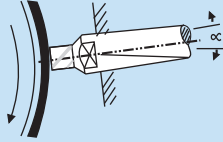
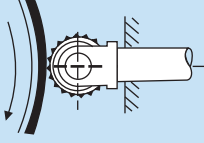
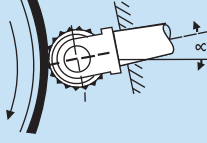
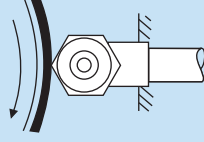
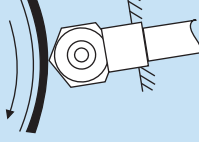
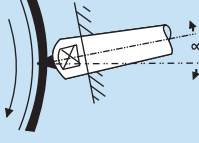
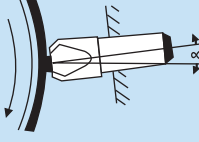
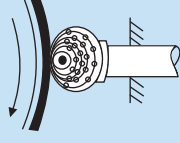
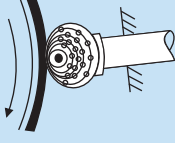
Guidelines For Use

Wheel speed for dressing and truing : Normal grinding speed.

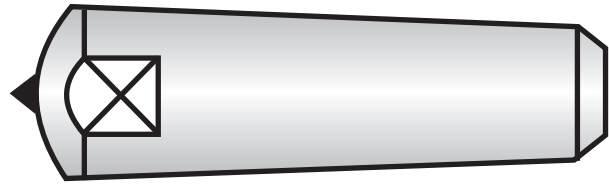
Copious and uninterrupted coolant supply is recommended. This increases the life of the diamond dressing tool and is often essential for proper functioning cooling tool engages the wheel.

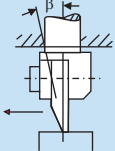
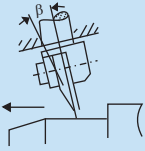
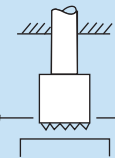
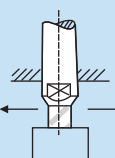
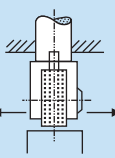
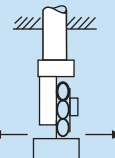
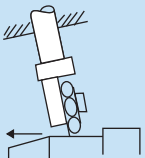
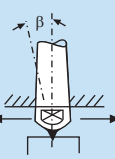
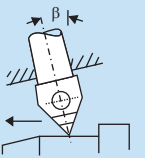
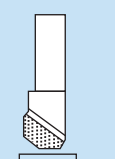
To change the effective roughness of the wheel normally it is best to change transverse feed. Increasing infeed rate has less effect and shortens dressing tool life.

Tool mounting must be vibration-free, with the clamping length as short as possible.

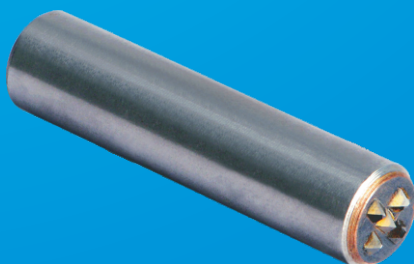
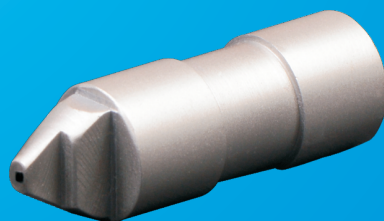
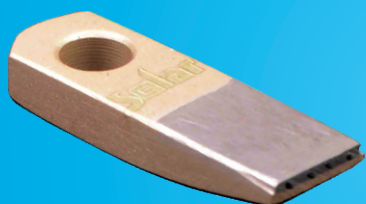
DIAMOND DRESSING TOOLS	Working Positions of DIAMOND DRESSING TOOLS	
	For STRAIGHT Mounting	For INCLINED Mounting
Blade diamond dresser		 Inclination must be compensated by swivelling the Blades in the holder possible up to 30°
Cluster diamond dresser		
Grit impregnated diamond dresser		 If the holder is used in inclined position, please state the angle of inclination.
Multipoint disc. diamond dresser		
Hexagonal disc diamond dresser		
Single point diamond dresser		 5° to max. 15°
Shaping tools		 5° to max. 15°
Multipoint indexable crown		

Guidelines For Use



WORKING POSITIONS OF DIAMOND DRESSING TOOLS		Infeed in mm	Travers feed (usual) mm/rev	Other information	
for STRAIGHT mounting	for PROFILE forming and truing				
 vertical or inclined upto max. 30°		0.01 to 0.03	0.05 - 0.5	For straight dressing, slightly diagonal positioning is possible provides finer surface quality	When using new dressing tools a break in period is desirable with increased infeed so that the diamond tool adopts to the diameter of the grinding wheel.
 vertical		0.01 to 0.05	0.3 - 1.0		
 vertical		0.005 to 0.03	0.05 - 0.5		
 vertical		0.01 to 0.05	0.03 - 1.0		
 vertical or inclined upto max. 30°	 inclination from 30° to max. 45°	0.01 to 0.03	0.05 - 0.5		
 vertical or inclined up to max. 15° relating to direction of rotation		0.01 to 0.03	0.05 - 0.5	When sharpness diminishes rotate the diamond dresser about 60° around its own axis.	
	 inclination from 30° to max. 45°	0.01 to 0.02	0.03 - 0.10	Please follow instructions of tool maker and machine manufacturer.	
	 side dressing	0.01 to 0.05	0.3 - 1.0	Rotate the head at regular interval.	

Notes...





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