

DIAMOND ENGINEERING



Stationery Diamond Dressers Technical Manual

Valume III

DIAMOND ENGINEERING



SOLAR DIAMOND TOOLS (INDIA) PVT. LTD.

For Europe :www.ipefrance.net Mail: solar@ipefrance.net Tel : +33 (0)668 980 020

VERTICAL LIMIT

This is an unique concept created by our team. This concept in 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.



Application of diamond dressing tools	1
Single point diamond dressers (Natural, MCD, CVD)	2 to 10
PCD and CVD Insert Dressers	11
Shaping Tools	12 to 14
Cluster dressers	15 to 16
Multipoint indexable crown	17
Hexagonal disc diamond dressers	18
Multipoint disc	19
Diamond grit impregnated dressers	20 to 23
Blade dressers analysis of economy Consideration & process advantages	24
Dressing condition	25
Grinding wheel surface generated by dressing with single point and blade dressers-a comparative study	26
Blade type dressers (Natural, MCD, CVD)	27 to 34
Diamond indenters	35
Guidelines for use	36 to 37
Notes	38

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 mark, 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	
100 320	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
0.25	$\begin{array}{c c} NP & NP & NPLZ NPBT BTLZ A & B & C \\ \hline \bullet & \bullet & \bullet & \bullet & \bullet & \bullet & \bullet \\ \hline \bullet & \bullet$	Style A
0.35	$\checkmark \checkmark \checkmark \checkmark \checkmark \checkmark \checkmark \checkmark \checkmark \checkmark$	
0.50		←
0.75		
1.00		Style B
1.50	$\checkmark \checkmark \checkmark \checkmark \checkmark \checkmark \checkmark \checkmark \checkmark \checkmark$	
2.00		
2.50		
3.00		
3.50		MT 1
4.00		40
4.50		
5.00		

Other shank dimensions available on request.

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.



NO.	SIZE	CT. WT.	DIMENSIONS
1	MT-0	0.05 0.07 0.10 0.15 0.20 0.25	31.5 25.5
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



NO.	SIZE	СТ. WТ.	DIMENSIONS		
4	1:13:15	0.08 0.10 0.15 0.20			
5	Voumard	0.05 0.08 0.10 0.15 0.20			
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.



NO.	SIZE	СТ. WТ.	DIMENSIONS		
10	8x35mm	0.05 0.08 0.10	35 90° ↓		
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	41.25 5°6 60°		

Other shank dimensions available on request.



NO.	SIZE	ст. wт.	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.

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. Cars 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 cansists of a synthetic MCD needle gripped in a holder the advantage of the synthetic diamand over the natural one is that its precise geometry remains constant 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 set variables such as feed. It is therefore highly suitable for CNC dressing processes and the mach ning of small grinding wheels, including profiled anes, 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 pass ble 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 Tupo
D	Т	L	Shank Type
0.6	0.8	4	MT 0
0.6	0.8	4	MT1
0.6	0.8	4	Ø10 x 50
0.8	1.1	4	MTO
0.8	1.1	4	MT1
0.8	1.1	4	Ø10 x 50
1.15	1.5	4	МТО
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 relained 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 cylindinial grinding. There is a cutout in the head of the dresser to make it easter to position the needle correctly with respect to the grinding wheel when setting up. Since this is a CVD needle, its arientation to the grinding wheel has no significant effect on the tool life of the cresser. Nevertheless it should be noted that the diagonal mounting leads to a greater over up (T dimension). The CVD is sintered into the shork harizantally with respect to the cutout and in this position the L dimension is the smallest.



Standard range of single point dressers with CVD needles

Needle Dimensions			Shank Tuna
D	Т	L	Shank Type
0.4	0.4	4	MT 0
0.4	0.4	4	MT1
0.4	0.4	4	Ø10 x 50
0.6	0.6	4	МТО
0.6	0.6	4	MT1
0.6	0.6	4	Ø10 x 50
0.8	0.8	4	МТО
0.8	0.8	4	MT1
0.8	0.8	4	Ø10 x 50
1.2	1.2	4	МТО
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 too has three working points on a defined rapius that can be



brought into play by ratating the insert.

A nertain amount of regimbing is possible to create the next largest radius

ΤοοΙ	Туре	Shank Lengtl	n A Radius R
		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
	PCD	6.5	0.250
		6.5	0.500
		6.5	0.800
		7.0	0.125
		7.0	0.200
		7.0	0.250
1.5		7.0	0.500
		6.0	0.125
		6.0	0.200
R		6.0	0.250
		6.0	0.500
		6.0	0.800
		6.5	0.125
		6.5	0.200
	CVD	6.5	0.500
	070	6.5	0.800
		7.0	0.125
		7.0	0.200
		7.0	0.250
		7.0	0.500
		7.0	0.800
Dresser Holder	Designation		Size
	PCD MT	1	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.



Other shank dimensions available on request.

Shaping Tools



ТҮРЕ	CAT NO.	RADIUS IN MM	DIMENSIONS
Diaform	SF 6125 SF 6250 SF 6500	0.125 0.250 0.500	$4.23 + 13.49 + 7.14 + 14.45 + 60^{\circ}$
Diaform	SF 6125 SF 6250 SF 6500	0.125 0.250 0.500	4.23 7.14 60° 60° 60° 60° 13.49 34.92 10°
ТҮРЕ	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



ТҮРЕ	CAT NO.	DIMENSIONS
Copying	Fortuna	
Copying	Schaudt	
60° Lapped Dressing Tool	Diamonds are and lapped to angles. Tolerance: ce T.I.R.± .002 Specify I A &	e ground precise enterset to 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-sharpending.

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" \times 6" long. If required in other sizes. kindly specify D & L All dimensions in mm

Multipoint Indexable Crown



A Multipoint Diamond Dresser in which sharp natural diamonds are set in a circular crown at right angle to the operating plane. As soon as the diamonds on the indexed position are completely used up, the crown can be reindexed on the shank for new points, Shanks for the crown are made to customer's specifications.

APPLICATIONS :

- All types of large wheels where fine truing is considered important.
- Specially recommended for cylindrical grinders.

ADVANTAGES:

- The diamonds can be completely used up and resetting is redundant.
- Since two or more diamonds come in contact with the wheel the work load on the diamonds is divided and the diamonds last longer.
- A large area of the wheel is dressed more efficiently in a relatively shorter time than a single point.
- As several points are in use simultaneously the feed may be safely increased.
- Finer finish is obtained on the wheel due to the crystal shape of the diamonds employed.
- Can be used for side dressing.

SIZES:

- 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.





Other shank dimensions available on request.

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.



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 002 - 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.



Other shank dimensions available on request.

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.



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



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.

СА	TALOGUE NO.	DIAMON	ID SECTION	DIAMOND SIZE		BOND		
	TCD-15			1000		1000 H M J		H M J
т	CD-15-P			1000		H M J		
Ţ	CD-BL-1 10x10x6		 ■ ■	1000		H M J		
T 1	CD-BL-2 15x10x7			1000		H J		
T 2	CD-BL-3 20x15x7	T	20 •	1000		H M J		
CA	TALOGU E 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			SOLA Diamor Thread grinding and pro as on to	R THREAD DRESSERS ad Grit Impregnated Dressers are used for finish g i.e. on screw thread, gear file grinding machines as well pol and plain grinder.		
64	F F F F F F 4 F 5 F	160 130 110 90 70			* LIGHT * ACUT CAN * EFFEC OF G IS MA	DRESSING FORCE E ANGLED WHEEL PROFILE BE MAINTAINED. CTIVE OPEN STRUCTURE RINDING WHEEL AINTAINED.		

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

Other shank dimensions available on request.



HOLDERS FOR DIAMOND GRIT IMPREGNATED



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.
- 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 varities 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 from & 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
- 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



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



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 property 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 :	 Centreless grinding (plain) Cylindrical grinding with wheels (500 mm, and above in dia.) Surface grinding (TOS, BLOHM and Other heavy duty large machines.)





Needle blade with natural diamond

TYPES	х мм	CATALOGUE NO.	BLADE DIMENSIC
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	





Standard blade with diamond grit

TYPES	х мм	FEPA	CATALOGUE NO.	BLADE DIMENSIONS IN MM
SAS	0.75 mm	D501	SAS - 075	
Dimensions of	0.90 mm	D711	SAS - 090	
The Diamond Plate	1.15 mm	D1001	SAS - 115	
20 x 15 x X	1.40 mm	D1181	SAS - 140	
SBS	0.75 mm	D501	SBS - 075	
Dimensions of	0.90 mm	D711	SBS - 090	
The Diamond Plate	1.15 mm	D1001	SBS - 115	
10 x 15 x X	1.40 mm	D1181	SBS - 140	
SCS	0.75 mm	D501	SCS - 075	
Dimensions of	0.90 mm	D711	SCS - 090	
The Diamond Plate	1.15 mm	D1001	SCS - 115	
15 x 10 x X	1.40 mm	D1181	SCS - 140	
SDS	0.75 mm	D501	SDS - 075	
Dimensions of	0.90 mm	D711	SDS - 090	
The Diamond Plate	1.15 mm	D1001	SDS - 115	
10 x 10 x X	1.40 mm	D1181	SDS - 140	
FAS	0.75 mm	D501	FAS - 075	$\begin{array}{c} & & & & \\ & & & & \\ & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & &$
Dimensions of	0.90 mm	D711	FAS - 090	
The Diamond Plate	1.15 mm	D1001	FAS - 115	
20 x 15 x X	1.40 mm	D1181	FAS - 140	
FBS	0.75 mm	D501	FBS - 075	
Dimensions of	0.90 mm	D711	FBS - 090	
The Diamond Plate	1.15 mm	D1001	FBS - 115	
10 x 15 x X	1.40 mm	D1181	FBS - 140	
FCS	0.75 mm	D501	FCS - 075	$\begin{array}{c} 30^{\circ} \\ \hline \\ 5 \\ \hline \\ 7 \\ \hline \\ 7 \\ \hline \\ 7 \\ \hline \\ 7 \\ \hline \\ 20^{\circ} \\ \hline \\ 20^{\circ} \\ \hline \\ 7 \\ \hline \\ 20^{\circ} \\ \hline \\ 7 \\ \hline \\ 28 \\ \hline \end{array}$
Dimensions of	0.90 mm	D711	FCS - 090	
The Diamond Plate	1.15 mm	D1001	FCS - 115	
15 x 10 x X	1.40 mm	D1181	FCS - 140	
FDS	0.75 mm	D501	FDS - 075	$\begin{array}{c} & & & \\ & & & \\ & & & \\ \hline \\ \\ & & \\ \hline \\ \\ \\ & & \\ \hline \\ \\ \\ & & \\ \hline \\ \\ \\ \hline \\ \\ \\ \\$
Dimensions of	0.90 mm	D711	FDS - 090	
The Diamond Plate	1.15 mm	D1001	FDS - 115	
10 x 10 x X	1.40 mm	D1181	FDS - 140	

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 (OCI arrangement is suitable



Selecting the right blade tool We have made it easy for you to select

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.

	Number of needles	Grit size Grinding wheel (Mesh)	Designation	Effective cutting width T	width at tip B	Item Code
-5	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

Standard range (centred version)





Standard OC Blade with MCD needle

	Number of needles	Grit size Grinding wheel (Mesh)	Designation	Effective cutting width T	width at tip B	Item Code
-5- 10.5-	1	80-120 60 46	2465-OC/1 2485-OC/1 24115-OC/1	0.8 1.1 1.5	4.0 4.0 4.0	FBD2200001 FBD2200002 FBD2200003
	2	80-120 60 46	2465-OC/2 2485-OC/2 24115-OC/2	0.8 1.1 1.5	6.0 6.0 6.0	FBD2200004 FBD2200005 FBD2200006
	3	80-120 60 46	2465-OC/3 2485-OC/3 24115-OC/3	0.8 1.1 1.5	8.0 8.0 8.0	FBD2200007 FBD2200008 FBD2200009
	4	80-120 60 46	2465-OC/4 2485-OC/4 24115-OC/4	0.8 1.1 1.5	10.0 10.0 10.0	FBD2200010 FBD2200011 FBD2200012
	5	80-120 60 46	2465-OC/5 2485-OC/5 24115-OC/5	0.8 1.1 1.5	10.0 10.0 10.0	FBD2200013 FBD2200014 FBD2200015

Standard range (off-centred version, oc)

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 $\ensuremath{\mathsf{All}}$ dimensions in $\ensuremath{\mathsf{mm}}$

Example of special blade tools with pre-prolished profile



Standard Blade with CVD needle

Because the CVD airmond 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 need e 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.

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

Standard range (centred version)

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



Standard OC Blade with CVD needle

This blace 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 80-120 60 46	3344-OC/1 3364-OC/1 3384-OC/1 33124-OC/1	0.6 0.8 1.1 1.5	3.0 3.0 3.0 4.0	FBD1200001 FBD1200002 FBD1200003 FBD1200004
	2	150-240 80-120 60 46	3344-OC/2 3364-OC/2 3384-OC/2 33124-OC/2	0.6 0.8 1.1 1.5	4.0 4.0 5.0 6.0	FBD1200005 FBD1200006 FBD1200007 FBD1200008
	3	150-240 80-120 60 46	3344-OC/3 3364-OC/3 3384-OC/3 33124-OC/3	0.6 0.8 1.1 1.5	5.0 6.0 7.0 8.0	FBD1200009 FBD1200010 FBD1200011 FBD1200012
	4	150-240 80-120 60 46	3344-OC/4 3364-OC/4 3384-OC/4 33124-OC/4	0.6 0.8 1.1 1.5	6.0 8.0 9.0 10.0	FBD1200013 FBD1200014 FBD1200015 FBD1200016
	5	150-240 80-120 60 46	3344-OC/5 3364-OC/5 3384-OC/5 33124-OC/5	0.6 0.8 1.1 1.5	7.0 10.0 10.0 10.0	FBD1200017 FBD1200018 FBD1200019 FBD1200020

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





Other shank dimensions available on request.

Diamond Indenters



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 for STRAIGHT mounting for PROFILE forming		Infeed in mm	Travers feed (usual)	Other information	
vertical or inclined upto max. 30	and truing	0.01 to 0.03	0.05 - 0.5	For straight dressing, slightly diagonal positioning is possible provides finer	
vertical		0.01 to 0.05	0.3 - 1.0	surface quality	When using new dressing tools a break in period is desirable with increased infeed so
vertical		0.005 to 0.03	0.05 - 0.5		that the diamond tool adopts to the diameter of the grinding wheel.
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 sha diminshes diamond dre 60 [°] around it	arpness rotate the sser about s own axis.
	inclination from 30° to max. 45°	0.01 to 0.02	0.03 - 0.10	Please follow of tool maker a manufad	instructions Ind machine cturer.
	side dressing	0.01 to 0.05	0.3 - 1.0	Rotate th at regular	e head interval.

Notes...





Corporate Office:

213, Bhaveshwar Complex, Opp. Railway Station, Vidyavihar (West), Mumbai - 400 086. India. Tel. : +91-22-2513 6660 / +91-22-2511 4744 / +91-22-2511 3166 Email : solardiamondtools@gmail.com • Web : www.solardiamondtools.com

For Europe :www.ipefrance.net Mail: solar@ipefrance.net Tel : +33 (0)668 980 020