

SUPERABRASIVES – WHEEL-CARE AND USAGE

Norton superabrasive wheels, both diamond and CBN are precision grinding tools carefully ground and balanced to give superior performance. Achieving the best results from these cutting tools like any other precision tool/instrument requires a minimum amount of preparation. The following steps of mounting, truing, dressing, should be followed to get the best possible performance from these superabrasive wheels.

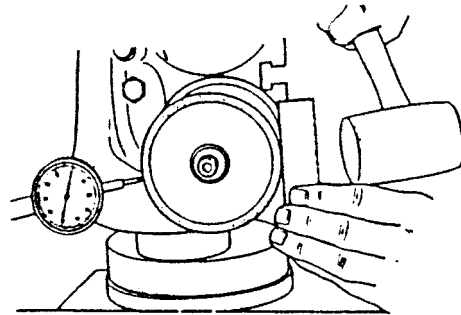
STORAGE AND HANDLING

1. If the grinding machine has a tapered spindle, mount each straight, flaring cup or disc wheel on a separate collet or adaptor. When changing wheels, the entire unit wheel and adapter is removed. Only then the wheel will remain running true. When needed again, the entire unit of wheel & adapter can be mounted directly on the spindle or arbor, thereby eliminating the time and abrasive lost in re-truing.
2. Ensure that the mounting flanges are flat and of equal diameter, especially on wheels such as vitrified bond wheels.
3. Avoid dropping or bumping the wheel. When not in use, store superabrasive wheels carefully. We suggest they be returned to their original container. This not only offers wheel protection, but gives complete wheel identification for future reference.

MOUNTING

Prior to mounting the superabrasive wheel on the machine, the wheel flanges and spindle should be examined carefully. Be sure flange surfaces are clean and free of damage. Inspect machine spindle for damage of excessive runout.

Mount wheel between hand tightened flanges - using a dial indicator, tap the wheel lightly with a block of wood or plastic hammer to minimize wheel runout to less than 0.0010". Tighten flanges securely and recheck with indicator before using. The use of one permanent mounting for the life of the wheel should be practised whenever possible.



TRUING

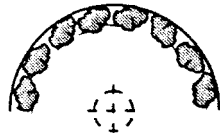
Truing a superabrasive wheel is defined as altering wheel geometry so that the wheel is precisely formed (flat or contoured) and running concentric with the centre line of the machine spindle. Prior to truing the wheel face, run a wax crayon over the wheel face. Any crayon left after truing will reveal untrued areas.

Important, DO NOT USE any liquid black ink on superabrasive wheels. Liquid inks are absorbed into the wheel's structure and will cause excessive amounts of usable superabrasive to be trued from the wheel face.

DRESSING

Dressing superabrasive wheels is a cleaning/sharpening process. Proper dressing leaves the wheel face sharp and free-cutting. Dressing is done with a stick which is pressed on the wheel face. During dressing the bond is eroded by the stick making troughs or talls behind the grits which aid in coolant flow and carry swarf off.

PROPERLY DRESSED WHEEL FACE



After Truing

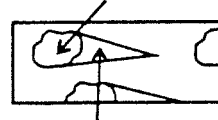
The wheel face is smooth and closed



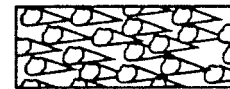
After Dressing

Wheel face is open with the grits exposed, ready for efficient grinding action.

After Dressing
CBN Grit



Tall bond supporting grit)



Path connecting the talls for coolant & chip flow

Dressing sticks should be 1 or 2 grit sizes finer than the super abrasive in the wheel. Medium grade sticks (H or I) work best for resin bond.

For metal bonds, use same grit size or 1 coarser than the wheel.

GUIDELINES FOR DRESSING AND TRUING

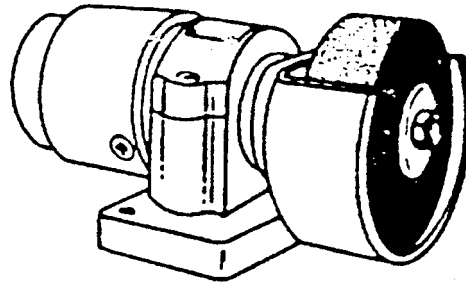
Bond	Abrasive	Dressing Method		Remarks
		Good	Best	
Resin Bond	Diamond	Dressing Stick 37C 220	Brake Truing Device 37C 220 Wheel	Always dress wet
Resin Bond	CBN	Dressing Stick 38A 220	Brake Truing Device 38A 220	Always dress wet
Metal Bond	Diamond and CBN	Dressing Stick on vice	Profile or T/C grinder with wheel	Wet or dry
Vitrified Wheels	Diamond Low Conc.	Dressing Stick 39C - 2 grits finer than wheel	Nibs with traverse Dressing	Always dress wet
Vitrified Wheels	CBN Low Conc.	Gem dressers or nibs	Rotary Dressing	Always dress wet
Vitrified Wheels	CBN High Conc.	-	Rotary Truing	Always dress wet
CVSG Wheels	CBN	Single Pt. Gem quality Dressers	Rotary truing	

STICK DRESSING MANUALLY

After properly truing super abrasive wheels, they must be inspected to see if the bond has opened up sufficiently to expose the grits. If the wheel has a shiny or glazed look it needs dressing or conditioning. Stick dressing is the preferred method and is done on the machine itself by holding a soft grade stock with 39C or 38A 2 grits finer than the grit size of the super abrasive wheel. The bond hardness of the stick must not be hard as they will grind the bond off too much and dislodge the diamond or CBN particles. For straight wheels and 2 type wheels with large surface areas of contact, the best method of truing or dressing is with a Braking Truing device.

BRAKE TRUING DEVICE

The brake truing device is designed for truing diamond and CBN wheels rapidly, effectively with minimum loss of abrasive. 39C or 38A wheels are used with the device which engages the super abrasive wheel as it is running and establishes a dressing ratio automatically by braking itself. The brake shoes which are housed inside the unit is actuated by centrifugal force generated when the spindle of the device begins to turn.



ROTARY DRESSING

For best dressing and truing super abrasive wheels mainly Resin bond and Vitrified bond Rotary dressers are used. Rotary dresser which rotates separately driven by a hydraulic or electric motor and is plunged or traversed against the wheel face to be trued.

The ratio of the speed of the Rotary dresser to the speed of the wheel being trued is called the dressing ratio. Different dressing ratios for bond types are given below.

Wheel Type	Truing Operation	Truing Mode $q=Vr/Vs$	Wheel/Truer speed ratio	Depth of Truing Pass	Truer Traverse Feed (mm/rev)
Resin Bond Wheel	Roughing	Counter-directional	-0,5 to -0,75	0,005 (max)	0.1 to 0,2
Resin Bond Wheel	Finishing	Uni-directional	-0,5 to -0,75	0,003 (max)	0.1 to 0,2
Vitrified Bond Wheel	Roughing	Uni-directional	-0,5 to -0,75	0,005 (max)	0.1 to 0,2
Vitrified Bond Wheel	Roughing	Uni-directional	-0,5 to -0,75	0,005 (max)	0.1 to 0,2